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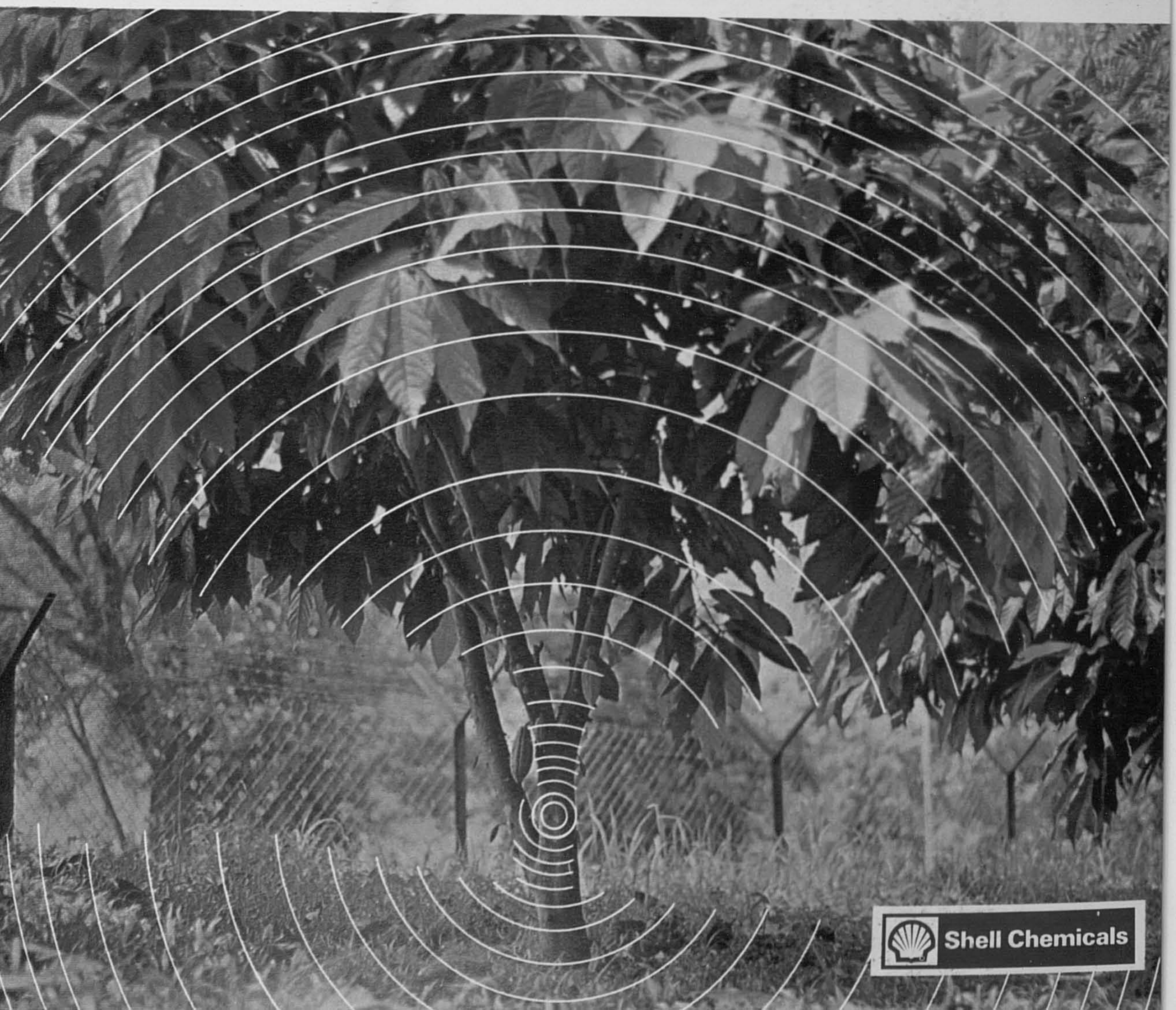

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N O T E

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SENTIASA MAJU

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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: —

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shows a Piper Pawnee spraying a pesticide against grasshopper attacks in a young oil palm plantation. The photograph was provided through the courtesy of Mr Brian J Wood of Chemara Research.

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Editorial :

Great expectations

The closing address by the Director of the Rubber Research Institute at the 1973 Planters' Conference was stirring stuff, delivered as it was in the euphoric climate of the currently over-high rubber price.

But Dr Sekhar was in no mood to minimise the continuing and growing threat of the synthetics to the natural rubber industry, and spoke of formidable production capacity in the USSR and reports that the Middle East, the largest source of crude petroleum, is moving towards the production of petro-chemical polymers. Added to this, new polymers have appeared, and of these Dr Sekhar said "They all approach the properties of natural rubber, but they do not surpass it. They will be just suitable for many of the applications where natural rubber is used." He went on: "These developments in the SR industry must mean we are in no position to relax; on the contrary we have continually to improve our own NR position."

The RRIM Director gave details of the amounts of natural rubber which will be required in the manufacture of the now universally accepted radial-ply tyre, and of Dunlop's revolutionary 'Denovo' get-you-home tyre. (Nothing was said of the motor manufacturer's dream that use of this tyre may make the spare wheel unnecessary!).

Dr Sekhar's view that the present price of rubber is "too high for comfort", (it rose to $2.20 per kg during the conference) is shared by many; but so is his feeling that a *short* period of compensating high prices will do no harm, especially to the smallholders. "However" he said, "we must condition ourselves to be happy with more reasonable prices".

Of the world demand for natural rubber we were told that while to-date the proportionate use of the commodity remains at 33%, the techno-economic norm exceeds 42%. This is saying in effect that by 1980 the present world production of natural rubber must be doubled. When the market demands natural rubber and cannot get it in sufficient quantities, up go prices and in come more innovations in the synthetic product.

"This" said Dr Sekhar, "is a challenge that we must face squarely", and he continued: "In the past, the greatest enemy of natural rubber has been ourselves: our lack of confidence in the industry; our lack of active implementation of research innovations; our failure to promote the concept that natural rubber can satisfy in quality and in quantity the world's requirement of isoprene rubber".

There followed a review of the data presented to the conference during the preceding two days, and after stressing the continuing need for increased and

quality-consistent NR, Dr Sekhar dealt with the prediction of the Institute's plant physiologists and agronomists, who he said, "have now convinced themselves that the days of 5 and 6-year immaturity periods will become a thing of the past. In a few years they will show methods that will reduce the immaturity period to 3½ or even 3 years". Advances in tissue culture, successful genetic manipulations and the genetic dwarfs were other attractive prospects for the future.

Smallholdings, described as "the basic life force of the industry today" must, said Dr Sekhar "take in all the innovations and . . . . be modernised if the industry is to progress".

On SMR quality, delegates were treated to a salutary account of the increase in the production of Malaysian technically specified rubber, tempered with a chiding of the sceptics who assert that this country's SMR production has not maintained its rate of growth. What Dr Sekhar described as "the present inhibition period" was, he said "very largely associated with the time required to establish large central factories under MRDC".

There followed a strong castigation of those who produce rubber with defects for which there was no scientific, technological or practical justification. Promising stern measures by RRIM inspectors against these offenders, the Director said: "Those who are unable to meet the standards have no business to be in the scene".

The next stages of the Standard Malaysian Rubber Scheme will be to introduce latex concentrate and special rubbers so that ultimately all rubbers leaving Malaysia would bear this hallmark of guaranteed quality.

Although Dr Sekhar disclaimed occult powers there was no mistaking his confidence in the future of NR. The two production sources: the large plantations and the economically viable smallholdings organised on a corporate basis as a plantation-type operation; the supply of high-yielding material with guaranteed levels in excess of 3,000 kg per hectare per year; tree architecture to remove all problems of wind damage, and discriminatory manuring based on soil and leaf analysis. A determined productive life of 20 years will end with the trees providing pulp for the paper and packaging industry; controlled stimulation may start after only 5 years of tapping, perhaps even earlier. Normal harvesting will be the monthly collection of coagulum in polybags; collection of latex as such will be made only occasionally, and then for special purposes.

The discovery of petroleum along Malaysia's shores brings with it the intriguing possibility that should the need arise, this country would be in the enviable position of having the best of both worlds, and be able to produce both the natural and synthetic product, compatible as they are in many mixed applications. "Either way" says Dr Sekhar, "it appears that we are well endowed".

Before thanking his listeners, and all who had contributed to a very good conference, Dr Sekhar ended his address thus:

"Ladies and Gentlemen, natural rubber has been considered by many as the grandfather of elastomers. This is a fact, but natural rubber shows no visible or discernible symptoms of ageing or weakening. It is going to remain and, if we put our minds together, it will remain the cheapest source of high quality elastomer. When the world is being bedevilled by energy crises and environment pollution, and population explosion, let us remember that ours is an industry which is a renewable resource and non-polluting. *Let us, therefore, not be dictated to by the prices in the market. Let us have faith in the produce we produce and the high quality product we sell. Let this confidence spur us to more intensive endeavour to NR modernisation.*"

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Sunflower

T. A. EL BARADI*

The following is a review article which appeared in the May 1973 edition of *Tropical Abstracts*. It is published here with acknowledgements to the Department of Tropical Research, Royal Tropical Institute, Amsterdam.

INTRODUCTION

Sunflower is believed to be indigenous to Mexico from where it was introduced into Europe in the 16th century. In the 19th century cultivation of sunflower extended rapidly, first in the USSR and southeastern Europe, and later in Argentina. More recently, and particularly after the 2nd World War, sunflower has been introduced into many other countries all over the world[8, 14, 15, 17, 25, 27, 42, 44, 47, 49, 60, 65, 67, 68, 69, 70]. Though sunflower, for oil production, is mainly cultivated in the temperate zone, the crop is suitable for the tropics, where it offers possibilities of large-scale production.

BOTANY

Sunflower (*Helianthus annuus*) is an erect coarse annual plant, reaching a height of 75 to 300 cm or even more[21]. The plant has a deeply penetrating tap root with shallow fibrous side roots. The stem, which is often branched and covered with rough hair is slender, cylindrical and woody outside, with a soft white pith inside. The stem bears alternate dark-green leaves, which are large ovate, cordate in structure and often hairy[15]. The stem terminates in a single yellow-coloured disc closely studded with florets forming the large composite flower. The florets contain both male and female floral parts. The fertilized florets form the achenes commonly known as sunflower seed. The plant is not self-pollinated and the pollen is normally not spread by wind[55]. Honey bees are the main, almost exclusive, pollinators[3,4,23]. In Russia, bee-hives are placed in sunflower fields at a rate of 0.8 to 1.2 per ha [27, 57]. Sunflowers cross-pollinate readily, therefore crops producing planting seeds should be grown at a distance of at least 800 m from other varieties[38]. The seeds of different varieties are differently marked and coloured from black to white, through various shades of brown, often with longitudinal striping in lighter or darker colour [15, 21, 69].

CLIMATE

Sunflower grows at altitudes ranging from sea-level to up to 2,500 m and under annual rainfall conditions varying from 175 or 250 to more than 750 mm[34, 40, 61]. The plant prefers high temperatures and seedlings are easily damaged by frost. Mature plants, however, withstand cold nights and frost. Sunflower is drought resistant and more tolerant of low temperatures than maize and soya bean[38, 48].

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* Staff member, Dep. Agr. Res., Royal Trop. Inst., Amsterdam.

SOILS

Sunflower thrives on fertile and deep well-drained soils. Sandy soils containing some organic matter provide reasonable conditions for this crop[57]. Heavy and poorly drained soils are not suitable. Generally, the crop can grow well on moist soils that will produce maize, wheat or oats. The popular belief that sunflower exhausts the soil is without any scientific support[27]. Sunflowers grow well on alkaline soils but are less tolerant of acid conditions[7]. The plant at the seedling stage is most sensitive to salinity; pot experiments showed that increasing salinity from 2.5 to 12 mmhos/cm adversely affected the germination percentage, and seedling dry matter yield. Sunflower is probably more salt-tolerant than safflower, wheat or sorghum, but less so than barley or cotton[46].

CULTIVATION

Sunflower, for oil production, is mostly sown in rows 45 to 105 cm apart and 15 to 40 cm within the rows. Time of sowing varies with the varieties, and producing countries, and whether the crop is to be grown in pure stands or inter-cropped[19, 27, 61]. Spacing between plants should be relatively close (15 to 30 cm) to ensure high yields and to encourage the development of relatively small heads which dry more quickly and are easier to harvest than large heads. The plants, however, are not to be spaced closer than necessary because of the possibility of increased lodging[66]. Sunflower can also be grown in sugar-cane inter-rows, especially in the ratoon crops [53]. Field trials, however, showed that inter-cropping ratoon cane with sunflower was not economical because of very low oil yields and reduced cane yield; moreover, chemical weed control was impossible because sunflower was injured by conventional herbicides[52].

ROTATION

Sunflower can be grown in rotation with maize, wheat, groundnuts, beans or sorghum [34, 54, 57]. Sunflower should not immediately follow cotton, sesame, potatoes or lucerne, because of the possibility of a high root fungus disease incidence[34]. The crop is of a short duration (3.5 to 4.5 months) and is therefore more suitable for double cropping than maize or sorghum[38]. In the Rep. of S. Africa, sunflower is sometimes used as an indirect control measure against witch-weed (*Striga asiatica*), the plant parasite of cereals, as this weed does not attack sunflowers. The root exudates of sunflowers induce the weed seed to germinate and in the absence of a host plant, the germinated weed withers and dies[57]. To avoid build-up of diseases, it is generally recommended not to grow sunflower more than once every 3 to 4 years on the same field[27].

FERTILISING

The nutrient requirements of sunflower, which vary with the varieties, soils, climatic conditions, and cultural practices must be properly studied, especially under tropical conditions[59, 61]. The crop uses large amounts of K and Ca and in general its response to fertilisers has been variable, being better on poor soils[48]. On a fertile soil sunflower responded well to K either singly or in a complete fertiliser, but

showed slight response to N or P[53]. Excessive N amounts prolong the maturity period of the plants and the drying of the heads, reduce the oil content of the seeds and promote lodging of the plants. Phosphorus is necessary for the formation of strong, healthy stalks, seed heads, and well-developed root systems[7, 66].

IRRIGATION

The crop, when irrigated, will give high yields of excellent-quality seed[57]. It has relatively low irrigation requirements, because of its rather short duration; irrigation may be required before sowing, at flowering and again 10 to 14 days later[38]. Sunflower, as mentioned before, withstands drought conditions relatively well, but subjecting the crop to water-stress, particularly between the formation of flower heads and the full ripening of the seeds, adversely affects oil formation[53].

WEED CONTROL

Keeping sunflower fields free of weeds is a very important aspect of its successful production. Control of weeds can be achieved through cultivation or through the use of various herbicides[16, 32, 33, 38]. While some chemicals are effective against weeds, drifts from phenoxy herbicides such as 2,4-D and MCPA are harmful to sunflower plants. Therefore, care is needed when these chemicals are applied to fields near those of sunflower[38, 53]. Yield reductions of 42, 38 and 37% were recorded in sunflower fields 100 m away from the application point of mixed ester, low volatile ester and amine formulations of 2,4-D, respectively, when these were applied as spray during a wind speed of 15 to 20 km/hr blowing in the direction of the test plants[48].

VARIETIES

Varieties may be grouped according to their height into: giant (180 cm or more) maturing in about 120–130 days, and semi-dwarf (seldom taller than 150 cm) maturing in 100–120 days. The varieties are sometimes grouped according to the size or the oil content of the seed (low oil content 29–35%, and high 38–44%). Efforts are being made to breed for new varieties with a seed oil content of 53–54% or even 58–60% as compared with 48–50% oil content of many of the current varieties[20, 58]. Vegetative growth, yields, seed and kernel characters vary with the varieties[43]. Certain varieties originally evolved in the USSR are now being successfully adapted to different ecological conditions and yield the highest amount of oil per unit area of any annual oil seed crop[18, 24, 29, 30, 31].

HARVESTING

Sunflower is mature when the back of the head turns yellow; however, the fleshy heads take a long time to dry, thus delaying harvest[27]. Heavy rains at harvest cause considerable seed losses through rotting. If harvesting should be delayed because of rains, treating the standing plants with Mg chlorate before harvest would reduce seed moisture content from about 27 to 14 or 12%[27]. Seeds do not shed when mature, so harvesting can be delayed if weather conditions allow for further

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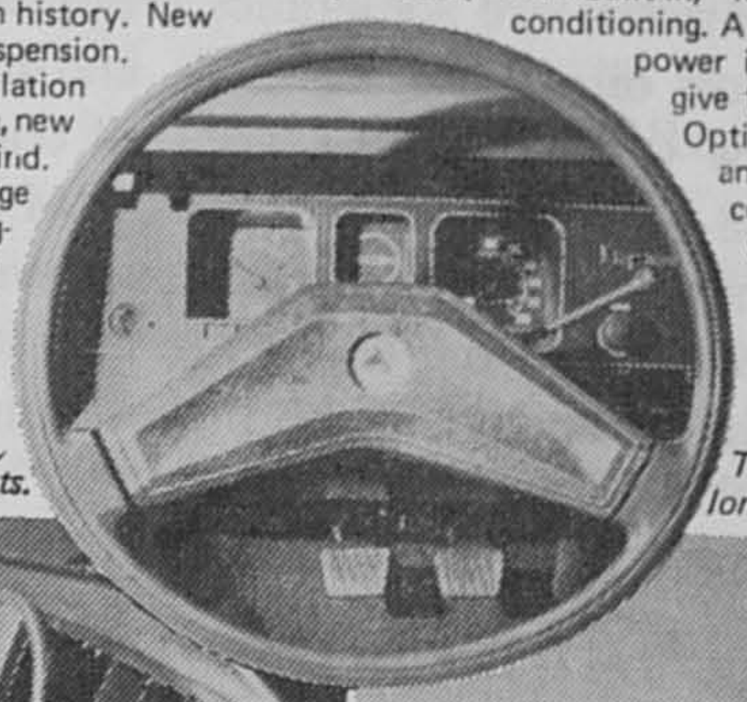

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drying of heads and seeds. Harvesting of small areas is mostly done by hand. The crop may be stooked (like maize) or may be cut and spiked on the stems to dry[22, 66]. The latter method enhances drying and gives protection against seed-eating birds. Upon dryness of the heads, they are threshed either manually or mechanically[61]. Large areas can be harvested mechanically. Some combines (reaper-thresher) are specially constructed for harvesting this crop, others are essentially maize or wheat harvesters, modified or fitted with attachments for the reaping of sunflower[9, 27, 56, 66]. A dwarf, stiff-stalked, smallheaded variety, with a uniform rate growth is most suitable for mechanical harvesting. Certain chemicals such as Cycocel (CCC) have proved in pot experiments to have a dwarfing effect on the plants, especially when applied through the soil at a concentration of up to 1,415 ppm a.i.[51]. If the seeds are to be stored for a certain time, their moisture content should not exceed 12% and, if storage is to be prolonged, moisture is to be reduced to 10 or 9.5%[48, 53]. Studies showed that sunflower seed with a moisture content of 17–18% was successfully stored under an atmosphere of CO_2[41].

YIELDS

Yields vary considerably with the varieties, cultural practices, climatic conditions and the producing countries, *viz.* from 650 or 850 to 1,450 kg seed/ha. More often, however, yields range from 1,120 to 2,250 kg/ha[22, 27, 56, 59, 60, 66]. Under controlled experimental conditions a yield of 3,580 kg seed/ha was obtained[61]. For grading, the seed should not contain more than 10% moisture, and be free from objectionable odours, foreign matter, and damaged and shelled seeds[57].

INSECT PESTS AND DISEASES

Sunflower is attacked by several common leaf- and stem-feeding insects such as the false wire-worm (*Gonocephalum macleayi*), bud worms (*Heliothis armigera* and *H. punctigera*), aphids (*Aphis gossypii*) and jassids (*Austroasca terraereginae*). The larvae of sunflower moths (*Homoeosoma electellum* and *Phalonia hospes*) damage the developing seeds. Various chemicals, such as DDT, endosulfan and methyl parathion, are available for the effective control of these insects[10, 11, 12, 28, 36, 48, 62, 63, 64].

The crop is seriously affected by various fungus diseases such as *Alternaria helianthi*, which is very destructive in areas with high temperature and humidity[1, 37]. Downy mildew (*Plasmopara halstedii*), a wide spread and very destructive seed- and soil-borne disease of considerable economic importance, can under favourable climatic conditions, destroy up to 80% of the plants. The disease infects the plants at all growth stages from 3 weeks after emergence until full bloom[37, 71]. Rust (*Puccinia helianthi*), a most common and most severe disease, wide spread in many countries, is caused by wind-borne spores. Yields of susceptible varieties may be reduced by 30–50%, and highly susceptible varieties may fail altogether to produce seed. Rotation, destruction of volunteer seedlings and the trash of the previous crop, and the location of sunflower fields as far as possible from those of the preceding season will give some control. There is some evidence that chemicals including

inorganic nickel salts, give protection against this disease. However, the use of resistant varieties provides the best control measure[40, 48]. The crop is also subject to infestation with many other fungus diseases such as *Pseudocercospora* spp., *Macrophomina phaseoli*, *Sclerotinia sclerotiorum* and *Verticillium albo-atrum*[2, 5, 6, 13, 26, 35, 45, 48, 50, 70]. It is worth mentioning that broom-rape (*Orobanche cumana*) is a major parasite of sunflower only in the USSR as this parasite is not reported to occur in other countries[48].

IMPORTANCE

Sunflower seed oil is now the 3rd in economic importance among edible/soap vegetable oils, whereas some 10 years ago it occupied only the 8th place[60, 68]. The seed contains but little amounts of cholesterol and is therefore excellently suited for persons with a heart condition[9, 35]. The oil is a soft type, has an excellent keeping quality, a relatively low solidifying point, is high in polyunsaturates, and when refined attains a pleasant flavour. It is highly regarded as a salad and cooking oil and is widely used as an ingredient in the manufacture of margarine and compound cooking fats. The oil is also used for technical purposes such as varnishes, paints, plastics, cosmetics and soap. The meal contains 40–44% protein and essential amino acids such as methionine, and is palatable to all types of livestock and poultry[27]. The meal can be mixed with other meals such as groundnut or soya bean to prepare a blend which provides a high quality protein rich in all essential amino acids which can contribute in solving the problem of protein malnutrition (Kwashiokor) widely prevailing among children of several Asian, African and S. American countries[47]. Sunflower seed meal is a good source of vitamin B-complex, it has been satisfactorily used in infant feeding[47]. A silage can be made from sunflower plants which is relished by animals[21, 56]. Sunflower husk is used for the preparation of ethyl alcohol, furfural and yeast. Threshed heads are used for the preparation of a good quality pectin[35]. The hulls are sometimes utilized as a source of heat or for the manufacture of logs to be used for burning in fire places[48]. Seeds of certain varieties are still used for confectionery, in the bakery trade or as feed for birds[27].

MARKETING PROSPECTS

The EEC (particularly the Netherlands and Fed. Rep. of Germany) is the world's major importer of sunflower seed accounting (in 1967) for 30% of the world's retained import. Large assignments are exported to Spain and Cuba. New markets have been opened in Turkey, Egypt, Algeria, Morocco and India. In the USSR, the volume of production and trade is under the control of the State. Prices for producers are fixed and annual targets for planting are issued[39].

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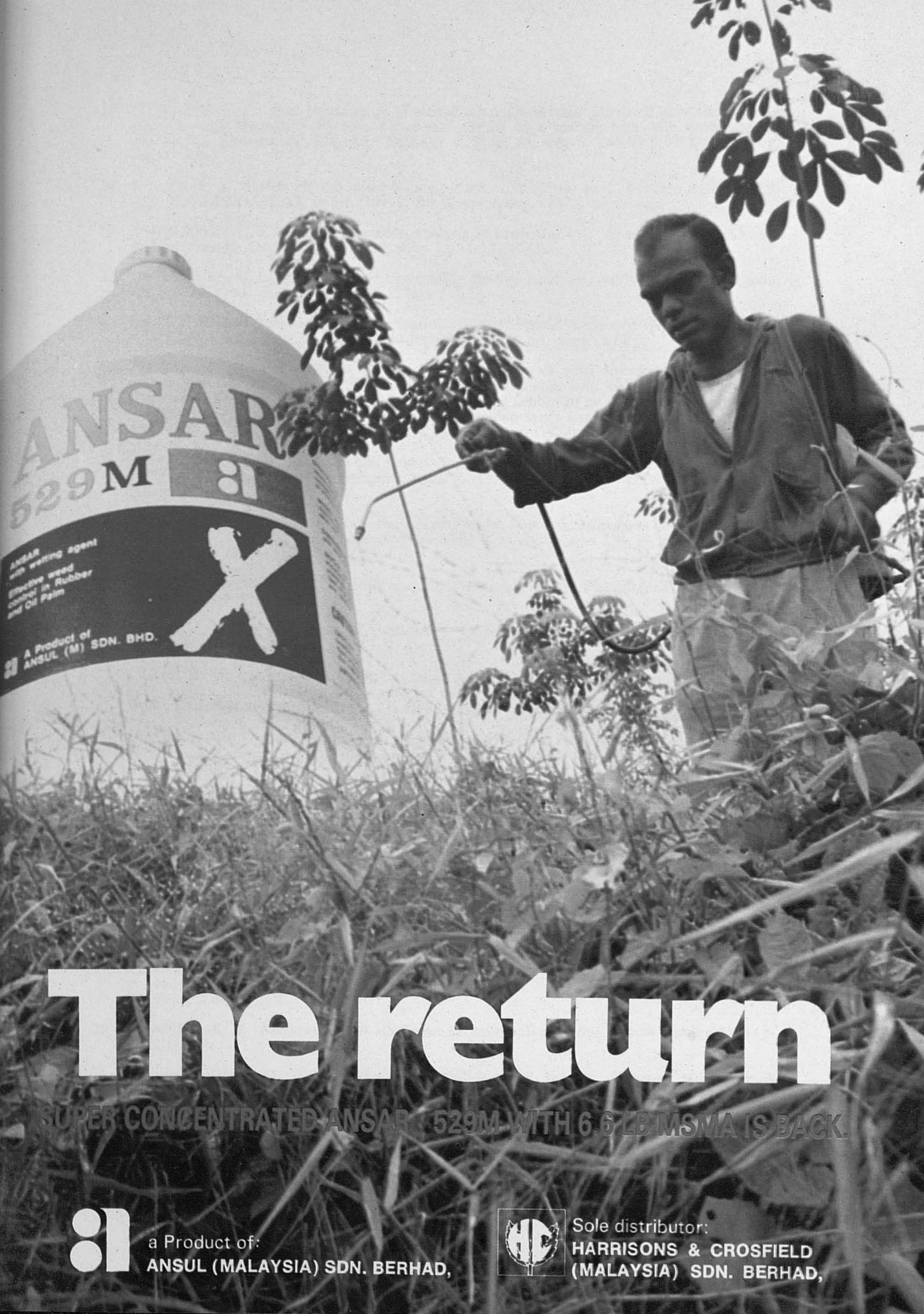
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That buffalo—he's so neglected

W. Ross Cockrill*

This article, which appears by kind permission of British Information Services, will be of particular interest to those who remember Mr David Wan's spirited championship of the buffalo,† at the 1972 International Oil Palm Conference.

Despite the same Christian name I have nothing in common with the late Colonel William F. Cody—for, while he gave much of his time and energy to the wholesale slaughter of the American buffalo (which, by the way, is not a buffalo at all), I have devoted a good many years to the conservation, care and use of the domestic water buffalo. I believe it to have a greater production potential than any other domestic species.

The water buffalo is second cousin to the bison and the wild African buffalo. It has been domesticated for more than 4,000 years. There are at least 140 million water buffaloes in the world and yet the animal is relatively unknown outside the "developing" countries. Perhaps because its dark skin, its gentle tractability, its peculiar affinity for water and shade and its slow, ponderous movement are self-effacing qualities, the buffalo has been largely ignored by animal scientists. The great livestock breeders of the west concentrated their attention on horses, cattle, sheep and pigs.

The African buffalo has never been domesticated though a few have been tamed. The true buffalo will not cross with cattle and neither the bison nor the wild buffalo will cross with the water buffalo. They have a distant tribal kinship similar to that of the sheep to the goat, or the ox to the yak.

A well-known agriculturist once told a Muslim audience: "I hate the buffalo as much as you hate the pig"; such unreasoning prejudice is much too common. Cattle protagonists are inclined to regard the buffalo with apathy or even active antipathy, while buffalo enthusiasts have an equal aversion to cattle.

As buffaloes exist in greatest numbers in the under-developed and developing countries of the world it should be obvious that they do not compete with cattle—but rather complement the output of cattle whether this is in the form of work, milk or meat. There are 18 identifiable water buffalo breeds. India has a population of about 55 million of them and China comes next with almost 30 million. Buffaloes are found all the way from Brazil to Burma, from Afghanistan to Australia and from Italy to Indonesia. And numbers are steadily increasing everywhere.

Many areas with limited buffalo stocks are seeking to introduce nucleus breeding material. Some countries, impressed by the potential of the water buffalo, are

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* *See* pge 289.

† Wan, D. (1972). The use of buffaloes in oil palm fruit collection. In *Advances in Oil Palm Cultivation.* (1973) (Ed. R.L. Wastie & D.A. Earp). Kuala Lumpur: Incorporated Society of Planters.

buying breeding animals for the first time and finding that with simple management methods the buffalo adapts readily to new surroundings. The USSR now has a population of almost half a million buffaloes and has been a big buyer in recent years.

There are no water buffaloes in either Britain or the United States of America, except in a few zoos. Buffaloes were introduced into England in the 13th century by Richard, Earl of Cornwall, brother to King Henry III, but they failed to "take", presumably because of poor management, and they died out after a few years. A major impediment to the introduction of buffalo stocks is the chance of bringing in disease. Unfortunately the best buffaloes live in countries where the livestock disease risk is high. However, maximum security quarantine conditions would allow buffaloes to be introduced at low risk. And the British and American genius for juggling with genes and improving breeds could turn its attention to a key animal for a protein hungry world—an animal which is outstandingly successful under modern management methods.

Something like 84% of the world's cultivable land is still tilled by man and his animals and most buffaloes are used for work. The buffalo, the "living tractor of the East", costs little to maintain and has a working life of 25 years or more. It produces two calves in three years, yields a small quantity of milk and when too old for further work can be sold for slaughter. It is so highly esteemed as a work animal or as a milk producer that the only buffalo meat reaching the market comes from old animals at the end of a long, productive life. It is usually a poor product, tough, stringy and without flavour.

Work in such diverse centres as Bulgaria, Italy, Thailand and Australia's Northern Territory has shown that, if buffaloes are fed, managed and reared for slaughter at an age of 12 to 16 months, a high yield of quality meat is obtained more economically than with cattle. What butchers refer to as the dressed carcass percentage is around 58%, but more significantly the meat bone ratio can be as high as 70%. The meat is tender and highly palatable. A succession of tasting panels in different regions of the world have found it to be indistinguishable from top quality beef.

Buffalo milk is pure white in colour and very rich. When the animal is reasonably well fed—and it thrives on lower quality fodders and less concentrates than cattle—the butterfat content of the milk will be anything from 8% to 12%. In most buffalo countries there is no such thing as a glut of fat or, indeed, a glut of anything.

Some countries—Iraq is one—concentrate exclusively on milk production. In the southern marshes, where the buffaloes are the mainstay of a semi-nomadic human population of 300,000, I asked an owner why he did not use any of his buffaloes for work. "Buffaloes," he said, "are ladies, and ladies do not work."

A few miles from Baghdad there is a resettlement village for marsh Arabs where many milking buffaloes are maintained, the milk being sold in the city. So profitable is this undertaking that the community is known as White Gold.

In India the average buffalo produces more milk than the average cow and goes on producing for more than twice the lifetime of a cow. Something like 65% of all milk consumed today in India comes from buffaloes. This milk is so concentrated it lends itself admirably to the process known as "toning", by which reconstituted skim milk is used to adjust the proportion of ingredients, reducing the fat content while maintaining or increasing other constituents.

Toned milk is a highly nutritious and palatable product which has a ready sale and which can do much to meet the enormous food need in protein-hungry India.

Buffalo milk products, butter, ghee—the cooking medium of the East—cheese, clotted cream and a host of others are universally popular. Ice cream made from buffalo milk is a rare treat. There is an extensively variety of buffalo cheeses. That great delicacy the mozzarella of Italy, esteemed by gourmets everywhere is made from pure buffalo milk.

In Italy machine-milking of buffaloes is common and many farms are highly automated. One of the most modern enterprises, Torre Lupara, near Caserta, has recently installed a rotary herringbone milking parlour which accomodates 24 buffaloes and allows eight minutes' milking time per animal. The average daily yield is 17½ pints (10 litres). Italy, with about 100,000 buffaloes, is rapidly moving into a leading position in buffalo management for milk production.

All breeds of buffaloes like water and enjoy wallowing. Observation has shown that where buffaloes are allowed to wallow in water or mud they spend longer in grazing. But it has also been shown in several areas—Trinidad, for example—that wallowing is not strictly necessary provided that plenty of shade is available. The buffalo is peculiarly susceptible to solar radiation and quickly suffers real distress—even sudden death—if left in the direct rays of the sun for too long.

One of the notable characteristics of buffaloes is their gentle temperament. They are tended in many countries by small children and are nervous only in the presence of strangers. When examining buffaloes closely the stranger must rely on some small, smiling child of perhaps six years of age to calm and control her enormous, dark-skinned, mud-plastered charge.

In India the women and girls tend, feed and milk the buffaloes while the men look after the cows and working bullocks. One interesting sidelight on this division of responsibilities is that buffaloes seem to be peculiarly liable to "hardware disease", caused by the ingestion of various metallic objects. In India these are most usually knitting needles and bobby pins.

The water buffalo is the animal of the small farmer. It is remarkable for its longevity—and in lands where the human life expectancy is not great the buffalo and its owner grow old together. They are usually very much attached to one another.

I have encountered many cases of buffaloes still putting in a good day's work at more than 40 years of age. They are often regarded as members of the family. A venerable Chinese lady in Taiwan once said to me: "When I die my family will be very sorry and they will bury me with much sadness. But if the buffalo dies the family may starve."

An old Australian stockman, born and reared in the harsh environment of the "Top End", told me a story which he said he had had from his grandfather. At the time we were watching a round-up of a mob of feral buffaloes—they were introduced into Australia about 150 years ago and "went bush" but now they are being re-domesticated with considerable success.

"After Noah had got all the animals aboard," went the stockman's story, "he was left with a job-lot—a sort of crook collection he couldn't pair with anything. There was a pig and a sheep, an old horse and a dog. He put them all into a big bucket and shook it up for ten minutes and out came a pair of buffaloes, see? They like to wallow like a pig. they herd as tightly as sheep—not like cattle at all—they are as much a servant as the horse and are as faithful as the dog."

This then is the animal which has the greatest potential of all for further development. It is fitting that Australia's Freedom from Hunger Campaign committee selected FAO's "Buffalo Project" for support.

The committee chose the project as one which was of an educational character and which would have its main impact in the countries of Southeast Asia.

The first fruits of the project will be seen later this year with the publication of a definitive volume on the water buffalo called "The Husbandry and Health of the Domestic Buffalo."

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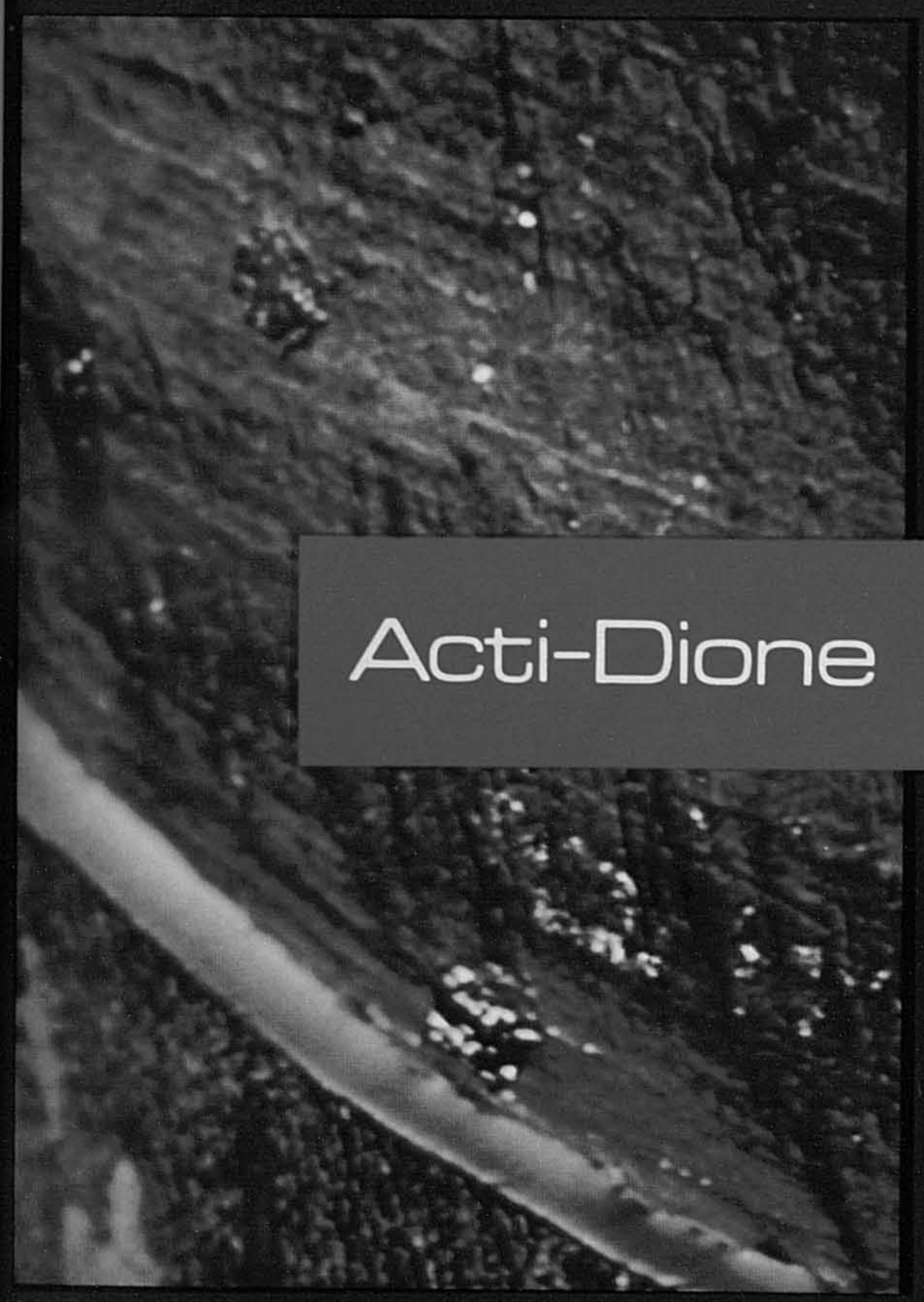

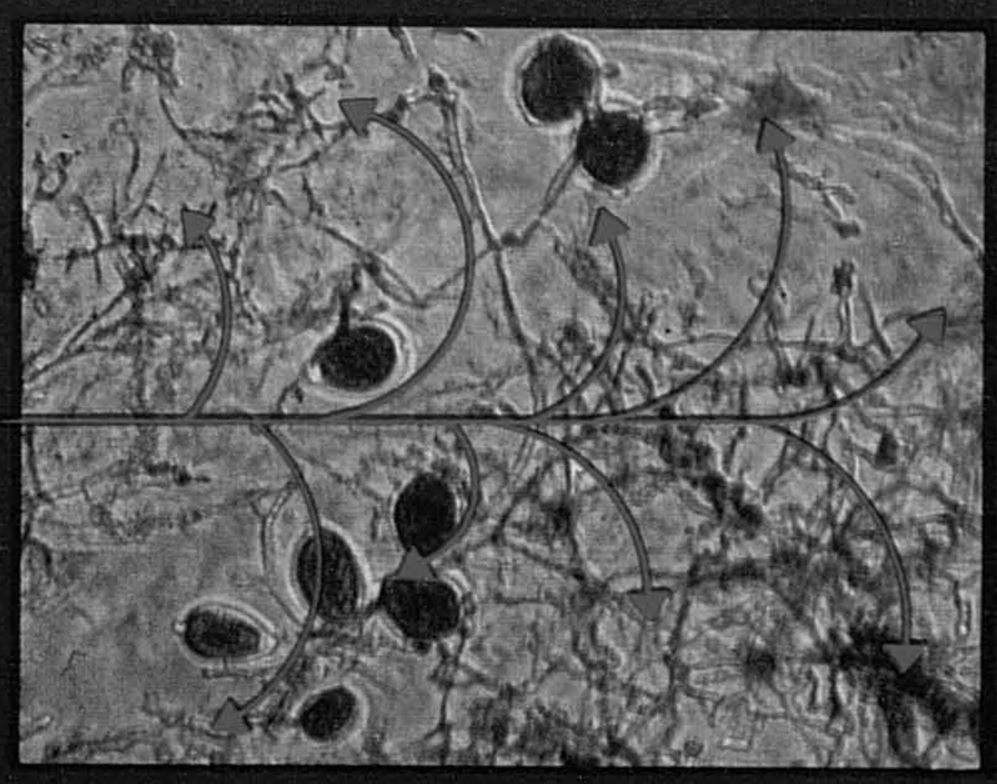

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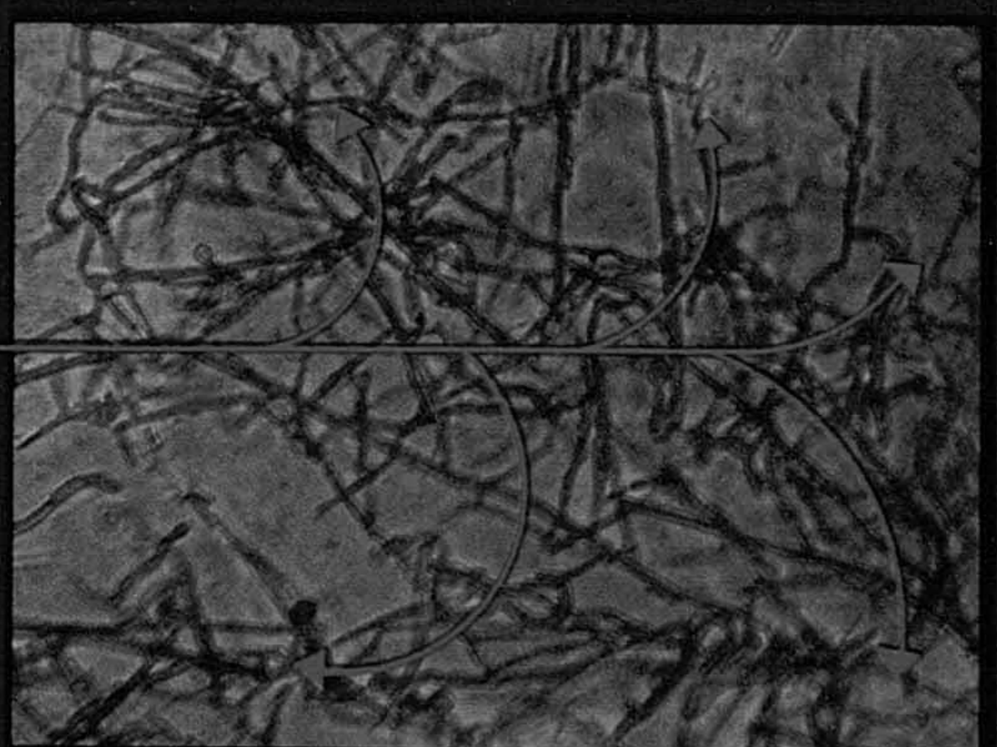

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Non-members	M$30	post free

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EXECUTIVE SECRETARY

The Incorporated Society of Planters invites applications from suitably qualified Malaysian citizens for the post of Executive Secretary, falling vacant on 1st March 1974.

In addition to routine responsibilities of an executive secretary the post involves dealing with plantation and agro-based companies; Government and research organisations; the co-ordination of editing and publishing activities of a monthly journal and books on planting technology based mainly on tropical agriculture in Malaysia; the organisation of international conferences and symposia, and the administration of a technical education scheme.

A minimum qualification of Higher Schools Certificate is required, with a working knowledge of Bahasa Malaysia and a high standard of English. Planting experience is desirable although not essential, but the applicant must have some knowledge or experience of tropical agriculture and plantation crops.

Proven administrative and managerial abilities and high personal integrity are essential.

The successful applicant will be required to understudy the post for a period not exceeding 6 months, depending on previous experience.

Salary will be commensurate with experience and qualifications.

Two character references are required, one of which must be from the applicant's immediate past employer.

Applications with full personal details and non-returnable pass-port-size photograph should be marked SECRETARY in top left hand corner of envelope and addressed to:

INCORPORATED SOCIETY OF PLANTERS
P. O. BOX 262, KUALA LUMPUR.

The monthly crop

The part played by rubber in the national economy was emphasised by Mr Lew Sip Hon, the acting Controller of Rubber Research, when recently he briefed a visiting technical mission from the People's Republic of China. In 1971 Natural Rubber accounted for 12% of the gross domestic product, 30% of total export earnings, and 26% of employment. Out of a total of 4.25 million acres of rubber in Peninsula Malaysia in that year, some 1.6 million were estates and the remaining 2.7 million were smallholders, the majority of the latter being holdings of less than 10 acres.

Twang! went the bowstring, as the mayor of Brighton let fly with the opening shot in a recent archery club contest in that town. His arrow sailed high over the target, cleared a distant fence and smacked into the side of a passing bus. The driver stopped his bus and climbed down with his hands up, as harrassed officials raced to the scene. "It was incredible" said one, "we never expected it to go that far". The worthy mayor is reported as having stood not upon the order of his going, and the police were said to be wondering whether to press charges.

After last month's Dateline Kuala Lumpur had gone to press we learned from the Rubber Research Institute of India's Newsletter that RRII intends to undertake researches into newer uses of rubber and that a pilot project contemplates the rubberisation of all roads within their premises and of selected lengths of heavy-traffic public roads. The project will be under the direct charge of the Institute's Director, Dr C.K.N. Nair.

Coupled with announcements along similar lines from Sri Lanka and Malaysia, this makes encouraging reading, but the rubber industry had better watch out—if they make these roads too comfortable to ride on, motorists might give up buying tyres and be content to run around on the rims.

Muchroom Soup sounds a bit filling but it heads the menu of one of Kuala Lumpur's newest restaurants. A member noted the following in the bill of fare at a Singapore airport snack bar:

FIRED EGG SANDWICH MIXED FRUIT IN BOWEL MARY WIDOW ICE CREAM

We are making a list of some of the more amusing 'howlers' and would appreciate additions to it from readers; but play fair please—they must be genuine.

Tea planting in Papua New Guinea where local management expertise is difficult to come by, might interest the more senior, single Malaysian member. The territory's tea industry is still small, with not more than a dozen nucleus estates, but it is growing. There is oil palm and a little rubber. The latter crop is definitely in need of 'new blood'.

Following a recent visit to Headquarters by a representative of plantation interests in Papua New Guinea, the Society is now in a position to put any interested member in touch with them. Application forms will be available in a week or two.

Calling all mosquito breeders In an editorial (July 11) *The Malay Mail* urges you to 'make sure that no water-containing receptacle is allowed to be used for mosquito breeding'. It's now up to you to get that across to the mosquitoes.

Do you know that there is an international standard method for writing the date? This ISO standard has been accepted by the UK and 20 or so other major countries. It is only concerned with when the date is written entirely in figures, and the rule is to write it in descending order of year, month and day. Thus the 13th July 1973 is written 1973–07–13. (For technical reasons the hyphen is recommended as the separator rather than the point, stroke or space.) One could presumably go the whole hog and add the time of day as in the date-time groups used in wartime signals. Thus a quarter past six in the evening of last year's Christmas Day would be 1972–12–25–1815. Neat eh? and they say computers love it.

To have and to have not Notice of a wine-tasting from the local branch of the Wine and Food Society states that: THERE WILL BE A GOOD SELECTION OF WINES SUBJECT TO THEIR AVAILABILITY.

The author of the article on page 283 is Dr W Ross Cockrill a leading British veterinarian employed by the Food and Agricultural Organisation of the UN. He has been (inappropriately) nicknamed 'Wild Bill' Cockrill because of his unflagging championship of the domestic buffalo, and is the editor of an Australian-financed publication containing the work of scientists on the subject.

Junk shortage in Penang According to a press report (*S.T. July 13*) a Penang man "was jailed five months for having less than one gramme of heroin at Presgrave Street".

A silly printing error marred last month's editorial. The final words should read: 'full and fruitful (not faithful) participation from the floor'.

LEST WE FORGET

Remember when hippy meant big in the hips,
And a trip involved travel in cars, planes and ships?
When pot was a vessel for cooking things in
And hooked was what grandmother's rug might have been?
When fix was a verb which meant mend or repair,
And be-in meant merely existing somewhere?
When neat meant well-organised, tidy and clean,
And grass was a ground cover, normally green?
When lights and not people were switched on and off,
And the Pill might have been what you took for a cough?
When camp meant to quarter outdoors in the tent,
And pop was what the weasel went?
When groovy meant furrowed with channels and hollows,
And birds were wing'd creatures, like robins and swallows?
When fuzz was a substance, real fluffy, like lint,
And bread came from bakeries—not from the mint?
When square meant a 90–degree angled form,
And cool was a temperature not quite warm?
When roll meant a bun, and rock was a stone,
And hang-up was something you did with a phone?
When chicken meant poultry, and bag meant a sack,
With junk trashy cast-offs and old bric-à-brac?
When jam was preserve that you spread on your bread,
And crazy meant balmy, not right in the head?
When cat was a feline, a kitten grown up,
And tea was a liquid you drank from a cup?
When swinger was someone who swung in a swing,
And pad was a soft sort of cushiony thing?
When way out meant distant and far, far away,
And a man couldn't sue you for calling him gay?
When tough described meat too unyielding to chew,
And making a scene was a rude thing to do?
Words once so sensible, sober and serious
Are making the freak scene, like psychodelirious.
It's groovy, man, groovy, but English it's not.
Methinks that our language is going to pot.

(*The author of this lament is unknown.*—Ed.)

Pesticides and the environment

Before starting to discuss in detail the effects that pesticides might have on the environment, it may be useful to try to explain what is meant by the term 'environment'. Every living organism is born into surroundings where its basic requirements are met: namely air, nutrition and shelter. This is its environment. The organism will also meet with resistance in the form of deficiencies, natural enemies, adverse weather and competition from members of its own species. It is a basic rule of ecology that the essence of animal life is to overcome environmental resistance and to exploit environmental benefits. But how do organisms overcome environmental resistance?

To this end, nature has opened up two fundamentally different possibilities. One is that the organism adjusts to its environment. This involves specialization. Life in the Arctic calls for adaptation to extreme cold, and in the desert for adjustment to lack of water as well as to great differences between day and night temperatures; which is why the desert areas and the cold zones of the world each have their own typical fauna. The second possibility is that the organism, instead of adapting itself to the environment, so adjusts the environment as to satisfy its own requirements. A typical example of this is the beaver which, by building dams, is capable of changing a whole river landscape, thus creating for itself the environment it requires.

How does man, from the purely biological aspect, fit into this pattern of interrelationships? He is most certainly not well adapted to extreme environmental conditions, nor is he well equipped physically to assert himself in the conflict with the environment. He has neither the strong sharp claws and piercing canine teeth required for seizing prey and tearing flesh, nor does he have the agility and speed to escape attack by fleeing. As a 'naked ape', to quote the description of man used by the British author Desmond Morris, he has no protection against either cold or heat. In short, he is far from being a highly specialized organism and as a species he would probably have become extinct long ago had he not succeeded, with the aid of his intelligence, in adjusting the environment to meet his requirements. This process began with the making and use of tools and fire, eventually culminating in the present-day state in which large parts of the earth bear the stamp of man.

All these inroads into the environment have not only produced the intended effects; they have also altered the environment for other organisms. The construction of a canal, for example, drastically changes the territorial conditions for all organisms which are unable to swim across or fly over it. From the ecological viewpoint, the construction of a town in a low-lying area creates an artificial range of 'mountains' so that bird species settle in it, which otherwise belong to mountain communities; examples are jackdaws, swifts and kestrels. This means that following the destruction of one type of environment, another is created. But one should be cautious in using the word 'destruction' in connection with the environment; a better term is usually 'environmental alteration'. Whether such an alteration is beneficial or harmful can only be decided from case to case, and even this often proves to be most difficult.

In considering the effects which pesticides have on the environment, we must examine separately the direct or indirect influences which pesticides have on water, on soil and on the organisms living in these habitats.

Pesticides in water

The mention of pesticides in association with water at once calls to mind the reports of fish being killed in the Rhine and Mississipi rivers. In the USA, the country with the world's highest use of pesticides, the Federal Water Pollution Control Administration has kept an annual census of fish kill since June, 1960. The annual reports of this authority have shown that of the number of fish reported killed, only 2.5% were attributed to pesticides. Pollution from municipal sewers and treatment plants has proved to be the most deadly type of contamination and thus to be responsible for most of the fish kills.

In Germany, opinions on the cause of the terrible fish kill that occurred in the Rhine in 1969 have changed, following the judgment of the public prosecutor who, after a year of inquiries, closed down the case, because it was proved that pesticides were not responsible(1). In such instances, public opinion has been influenced all too often by over-hasty reports. Another characteristic example of this is provided by an incident in Austria(2). The Forest Service had announced that a control operation against forest pests would be carried out in the early hours of a certain day. At about 9 o'clock that day, people rang up saying that large numbers of fish had been killed as a result of the insect pest control operation. But the operation never took place. It was cancelled because of unfavourable weather!

In North America, press and radio have been full of dire predictions about Lake Erie, suggesting that it is almost 'dead'! But the true facts reveal that it is far from dead. The US Bureau of Commercial Fisheries has kept records on the catch of fish by commercial fishermen on the Great Lake since 1867. On Lake Erie, the annual catch during the 1930s, before pesticides came into wide use, averaged 42.6 million pounds. Today, the annual catch from this so-called 'dead' lake averages better than 50 million pounds, in other words about 20% more than some 35 years ago, despite the advent of the 'pesticide era'(3).

Nevertheless, nobody disputes that many pesticides are toxic to fish, and there is every justification for demands that pesticides must always be used responsibly and with extreme care.

It is not disputed that residues of pesticides do enter waters as the result of runoff, although exhaustive studies have shown that they do not cause significant contamination. For many years the US Geological Survey has monitored streams of the Western United States. Where monthly water samples from 21 sites were taken over a two-year period, from October, 1966 to September, 1968, the investigators reported: 'Pesticide concentrations found were never in excess of the permissible limits established for public water supplies by the National Technical Advisory Committee to the Secretary of the Interior'. According to data in the report, 51% of the water samples analysed disclosed no residues. In 41% of the

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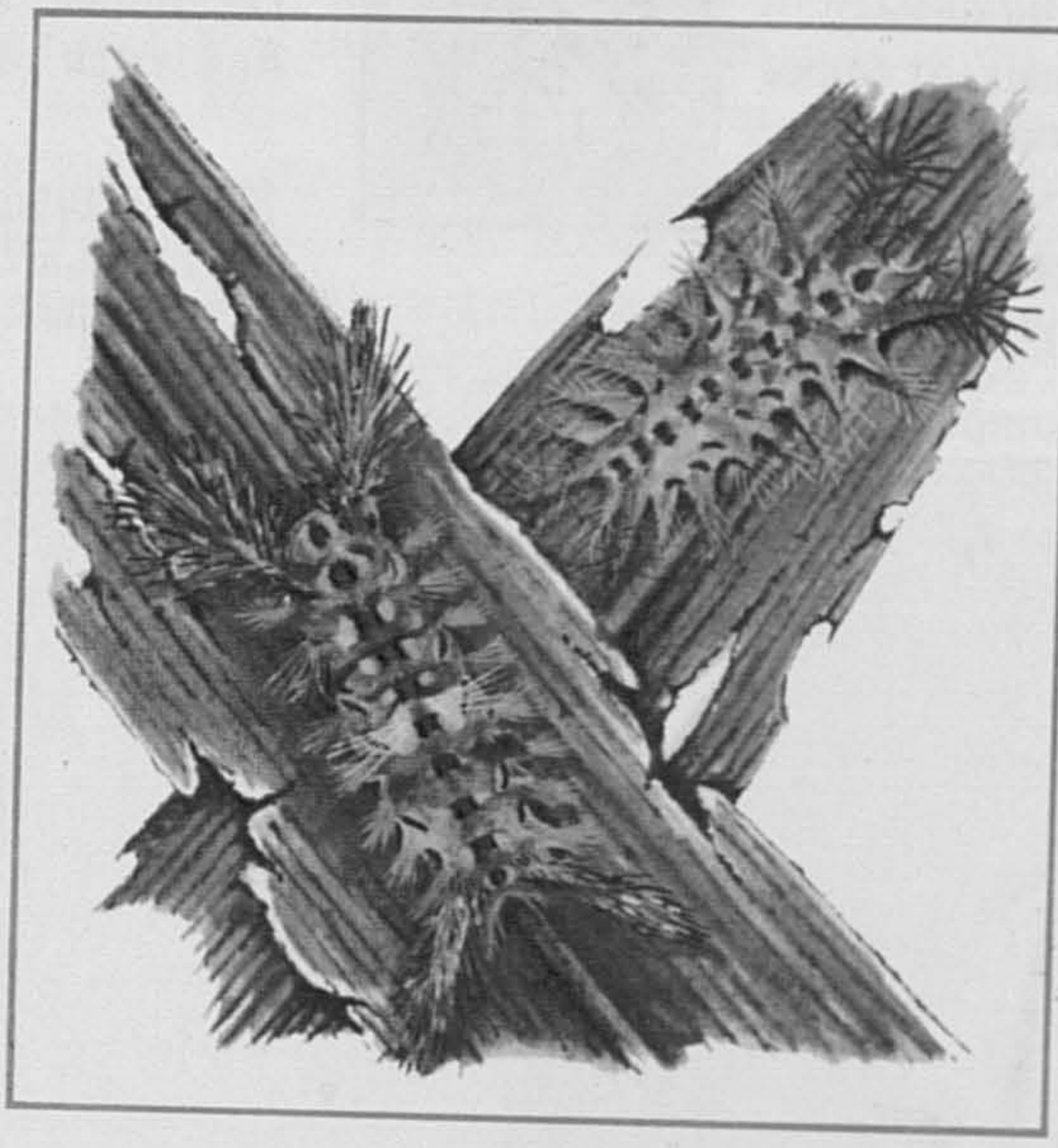

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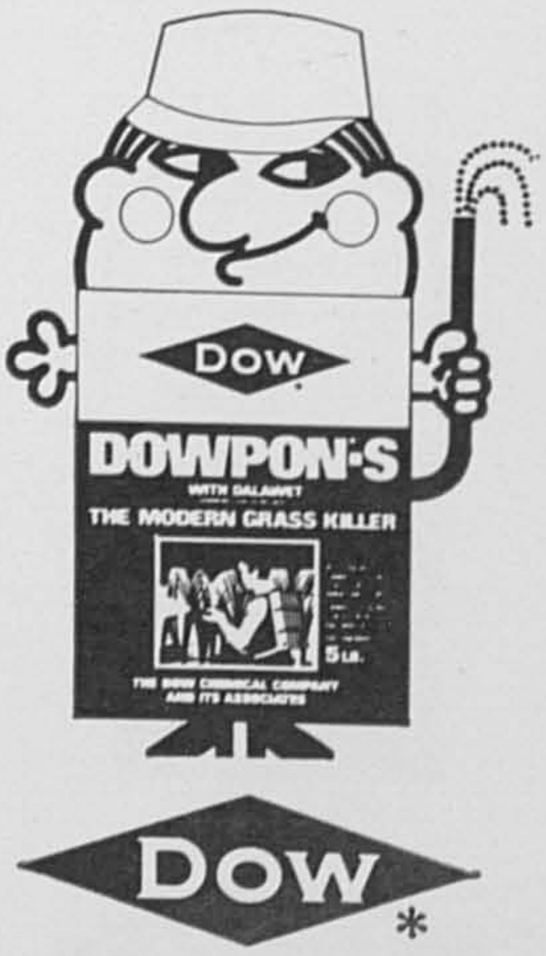

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samples, the pesticide residues amounted to as little as 10 parts per trillion, which is the minimum detectable level. And in the remaining 8% of the samples the highest level found was 0·12 parts per billion[4], in other words, 12 parts in 100 million. This means that in order to ingest one gram of residue, one would have to drink about ten million litres of water.

Some time ago a paper was published concerning the situation in oceans[5]. Statements in this paper could lead readers to conclude that the oxygen supply of the human race may be endangered by the effect of DDT on marine plankton. It was asserted that DDT inhibits photosynthesis (the ability of plants to form carbohydrates from carbon dioxide and water with the aid of light). As all life on earth depends, directly or indirectly, on photosynthesis, this was a most alarming report. But in actual fact it was based on the results of a very limited laboratory study made on four species of marine phytoplankton, of which there are thousands. It was found that one part per billion of DDT had no effect on photosynthesis but that 10 parts per billion seriously interfered with it. While there are several inconsistencies in this limited study, the principal point that has been overlooked is that the levels of DDT plus its metabolities in ocean waters are reported to be only one part per trillion or less. Levels would not rise above this figure even if regulated use of the compound were to continue. Thus, the alarm has been raised about a residue one thousand times less than the no-effect level, and that in respect of only four plankton species.

Pesticides in soil

Each soil is a complicated system, its characteristics being determined by its particle size range, its origin, its content of organic matter, its chemical properties, its water-holding capacity, and its fauna and flora. With all these factors to be considered, and as there are so many different types of pesticides, it is difficult to make a generally valid assessment of the behaviour of pesticides in soil. Let us first deal with the insecticides.

Most organochlorines (or chlorinated hydrocarbons), the best known of which is DDT, are persistent insecticides. Their persistence is largely due to their slight solubility in water. But consequently, and this is a most important point, they are not transported in subsurface water. In other words, they do not infiltrate into ground-water nor are they transported sideways into open waters. At the most, this can be brought about by erosion of soil particles to which such pesticides adhere.

Studies on the behaviour of DDT in different soil types have shown that its movement in the soil is minimal. Following the application of DDT for the control of forest pests, analyses were made which revealed that very little DDT had passed through the forest floor and even less through the surface organic layer. In laboratory experiments conducted to study the behaviour of DDT in eight types of soil, the insecticide was applied to the surface of a column of soil, and amounts of water simulating rainfall were introduced at the top of the column in an effort to wash the DDT through it. No DDT was leached through any of the soils except for a small fraction when an amount of water equalling 400 times the weight of the

soil was used[6]. It is not disputed that DDT and other chlorinated hydrocarbons remain persistent for a relatively long period in soil, but in many cases this is a highly desirable property, as, for example, in the control of termites.

For people to speak of a general contamination of soil by persistent insecticides is clearly mistaken, as they remain almost *in situ* at the site of application. Nor should it be forgotten that, while extremely advanced analytical techniques are used today for detecting minute amounts of residue, accurate results are only likely to be obtained by thoroughly competent analysts. That errors can occur is well illustrated by the remarkable case of an analysis carried out in the mid-1960s on soil samples which had been stored in sealed containers since 1940. According to this analysis traces of aldrin and DDT were present in the samples, yet these insecticides were not yet on the market in 1940! [7].

The stability of herbicides in the soil has been very exhaustively studied. Certain soil bacteria are an extremely important factor in the degradation of chemicals in the soil, and they play a part in the metabolism of many soil herbicides. A full knowledge of the persistence of herbicides in the soil is particularly important because it has a vital bearing on the following crop. Obviously, therefore, the agricultural chemicals industry is interested in developing and marketing only herbicides which will impose no limitations on, say a farmer's choice of crop rotation.

What is of paramount importance, of course, is the maintenance of soil fertility. It is interesting that not a single case has yet been reported of soil fertility having diminished as a result of the proper use of pesticides on intensively managed farms operated on modern lines. On the contrary, such farms which make extensive use of pesticides continue to record increasing yields year after year.

Pesticides and wild animals

It is repeatedly reported that wildlife is threatened by the use of pesticides. Interest is especially centred on game. Careful studies of all dead game sent for autopsy at the Institute of Animal Hygiene at Freiburg (Breisgau), in the Federal Republic of Germany have shown that 93% of the animals died of diseases. In the period 1960 to 1965 only 1.5% of the examined animals were found to have died from poisoning by pesticides—and these, it was later discovered, had been improperly used. Similar results have been obtained by several other research institutes, examining altogether more than 10,000 game animals[8]. Studies undertaken in Austria on dead game collected from an area where pesticides had been intensively used showed that these products were not responsible for the deaths, the chief causes of which were injuries suffered in collision with vehicles, infectious diseases and parasite infestation. In the Federal Republic of Germany alone, about 300,000 deer and hares are killed every year by traffic.

Pesticides have been used intensively for 25 years for the protection of crops. If there were any truth in the charges that their use has had devastating effects on wildlife, stocks of game would have been heavily depleted by now. But on the contrary, the population density of game is constantly increasing. Convincing

evidence of this is furnished by a comparison of the numbers of game taken in the West German province of North Rhine-Westphalia in the 1938–39 and 1969–70 hunting seasons[9]:

Species	*1938–39*	*1969–70*	*Change*
Red deer	2 046	2 526	+ 23%
Fallow deer	82	876	+968%
Roe deer	36 735	55 691	+ 52%
Wild boar	937	3 536	+277%
Hares	221 000	229 400	+ 4%
Rabbits	480 000	292 740	- 39%
Pheasants and partridges	346 000	408 955	+ 18%
Wild duck	15 400	57 264	+272%
Foxes and badgers	17 500	17 827	+ 2%

With the exception of the rabbit population, which was decimated by myxomatosis, all species of game have, it can be seen, considerably increased in numbers. This increase has taken place during the period in which increased use has been made of modern pesticides. In the Braunschweig area of West Germany, where especially intensive use is made of pesticides, studies were conducted to establish whether there were any relationships between the use of pesticides and the population density of game[10]. The studies surprisingly revealed that in warm, dry years when very large amounts of pesticides obviously had to be used, the population density of game was also very high.

Pesticides and birds

The situation with birds is really no different from that concerning game animals. Of course, small animals are more at risk than big ones, because the smaller the body, the greater, usually, the amount of food ingested per unit body weight. Allegations that pesticides are a threat to birds are especially strong, perhaps, because many people's emotions tend to run high where this particular class of wildlife is concerned. In the last few years, the populations of many game bird species have considerably increased, and so have those of many song-birds, including the blackbird. On the other hand, there are also certain bird species which constantly tend to decline in numbers or are even threatened with extinction. These include, in particular, certain species of birds of prey, such as the peregrine falcon in Europe and the bald eagle in America—the latter enjoys great public interest as it is the national emblem of the United States.

What tends to be forgotten is that these birds had been declining in numbers for a long time before pesticides came on the scene. This is not surprising in view of the changes that have taken place in the environment: increased building and traffic, intensified utilization of land and disturbances arising out of the growth of tourism deprive such birds of the conditions they require for their existence. There

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has also been over-shooting (at least in the past) and, worse, the theft of young birds. The emergence of falconry as a fashionable sport has seen the development of a trade in falcons and hawks, which has resulted in the raiding of nests.

In the United States, the Endangered Species Programme of the Bureau of Sport, Fisheries and Wildlife includes 60 species of birds[11]. In listing the causes for the decline in numbers, pesticides are mentioned as a possible contributing factor in only four of the 60 species—osprey, bald eagle, peregrine falcon, and California condor. Moreover, the criticism levelled against pesticides in this particular case relates only to the persistent types. The food chain is said to play a part here.

It is often been reported that since the chlorinated hydrocarbons are concentrated as they ascend the food chain, carnivorous birds at the top of this pyramid reach the highest concentrations and face special hazards—hence the charge that this is responsible for the decline in osprey. Very high DDT concentrations in the body do apparently affect the calcium metabolism in a few bird species, resulting in thinner egg shells which break during brooding or when the eggs are turned. But this applies only to very high levels of DDT residues and to a very limited number of bird species. Problems of this kind have never arisen following the use of insecticides which break down rapidly.

Another 'statement' which is repeatedly cited in the literature, without ever being closely examined, is that DDT has been found in the body fat of Antarctic penguins[12]. This is really very strange because no one knows where this DDT comes from. In other words, people have concluded that 'DDT contamination' is world-wide, extending even into the Antarctic. But this conclusion cannot be substantiated. If all the DDT so far produced were to be evenly dispersed in the upper 10 metre layer of the world oceans, the quantity of the product that would then be present in every cubic metre of water in this layer would only amount to about 0·000003 gram. It is inconceivable that any organism is capable of concentrating DDT from such dilutions. The alleged residues in the Antarctic penguins, therefore, must have entered their bodies by some special pathway, and not as the result of a 'world-wide contamination'.

* * *

Pollution of the environment is a problem of vital importance. It is recognised that there are many pollutants arising from man's activities, including various forms of industrial fall-out and, very important, radiation. Remedies must be, and are being, sought. To single out pesticides, as so many do, as the main pollutants of the environment is to misjudge the situation. Wrongly or carelessly used, pesticides can certainly be harmful; but properly used they are an ally, not an enemy, in the struggle to preserve a healthy environment.

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The third article in this series (*Pesticides in the modern world*) will appear next month under the title *Crop protection and the balance of nature.*

DATELINE KUALA LUMPUR

A POOR VIEW

Our radio and particularly our television services continue to provide a fair amount of fodder for letter writers to the newspapers and this is because the press provides the only medium for the licence buyer to air his views. The listener or viewer with complaints or suggestions could always write a private letter to the broadcasting authorities; but the response to those published in the press is so poor that this is not a very encouraging prospect.

A major cause of dissatisfaction is that there is no *official* programme published in advance and planned viewing or listening is practically out of the question. The programme printed in the morning or even afternoon paper is frequently unreliable; programmes are cancelled, postponed or changed with little or no notice to the public. The necessarily limited space available in the newspapers does not permit of any kind of description of a new programme and if, as often happens, the name is misspelt, you may have to stay up till 11 p.m. to find out what it is all about and then only to decide its not your sort of programme.

Given that the functions of a broadcasting organisation are to inform, entertain and educate (not the schools broadcast type), it can be said that both our radio and TV, apart from information about the programmes themselves, do a reasonable job on the first function. National and world news is well covered although visual news on TV hardly exists at all; it's merely radio news with the reader photographed, together with those maddening 'still' cut-ins of people or places in the news, as the name is mentioned.

As to entertainment/education, precious little time is devoted by either medium to classical music, whilst there is a pulverising plethora of 'pop'. Speaking of 'classics', if the cinema films screened late on Saturday nights were in fact classics, their proper place would be at an earlier hour. Age alone cannot confer classicism on a run-of-the-mill commercial film, no matter how good it was at the box-office in its day.

On the subject of timing, most viewers feel that the excellent British series such as Elizabeth R., Western Civilisation and The Wives of Henry the Eighth, which are educational as well as entertaining, should be put out between 7.30 and 10.30 p.m. and that the meretricious 'optical chewing-gum' such as 'Emergency' be kept for the moronic night owls.

Sports coverage is fair but so very rarely 'live' and at length. We get videotape clips at a later date, for the most part. We saw nothing of the visiting Chinese table-tennis team until after their departure. If this dearth of live sport telecasts is tied up with gate-money, surely those viewers who live too far away to attend (the majority) should be considered. Anyway, it's very doubtful if the prospect of a live telecast ever kept at home many who had intended to pay at the gate.

We have two television channels, presumably to provide a reasonable alternative programme, and yet we still get similar types of programmes going out simultaneously, especially in the later evening at weekends. This annoys nearly everyone—those who don't like the type of programme and those who do. One lot has nothing to look at and the others are torn between the two channels.

Colour television in 18 months' time (as we are promised) must seem to many like trying to run before we can walk. A colour set costs about five times the price of a black-and-white one and there are so many people who can't afford the latter and so many parts of the country without electric supply where even a community B & W set is a thing of the future.

FM and even stereo radio transmitters are very much cheaper than colour television and thousands of people already have transistorised radios all ready to receive FM if not stereo broadcasts; also there are many parts of the country which are not reached by the present radio broadcasts, at least not with a signal strong enough to allow enjoyable listening. A good radio service which reaches all parts of the country is also a very valuable asset at times of floods, forest fires or other natural disasters.

There is a desperate shortage of criticism of any kind; we hear nothing of films before they appear at the cinemas (except sometimes weeks or months beforehand), of books before they are published or appear on the bookstalls here, of concerts or recitals before or after they take place. In other words, we get nothing in the nature of a critique relating to the arts, the press or politics.

Admittedly, we have a rather polite if faint-hearted forum on TV and a rather good 'Window on the World' on radio, the latter weakened only by the sharp contrast in its treatment of foreign governments (bold) and our own (pusillanimous).

Several writers to the press (and we, too) have advocated the issuing of a questionnaire by the broadcasting authority which would enable the viewers and listeners to register their preferences in terms of programmes and of timing. We went on to suggest that the questionnaire be a controlled document, issued only on purchase of the licence so that 'he who pays the piper calls the tune.'

Many people feel that if as much energy was devoted to discovering what the public wants as there is to exacting the licence fees, we would soon have a much more satisfactory broadcasting service.

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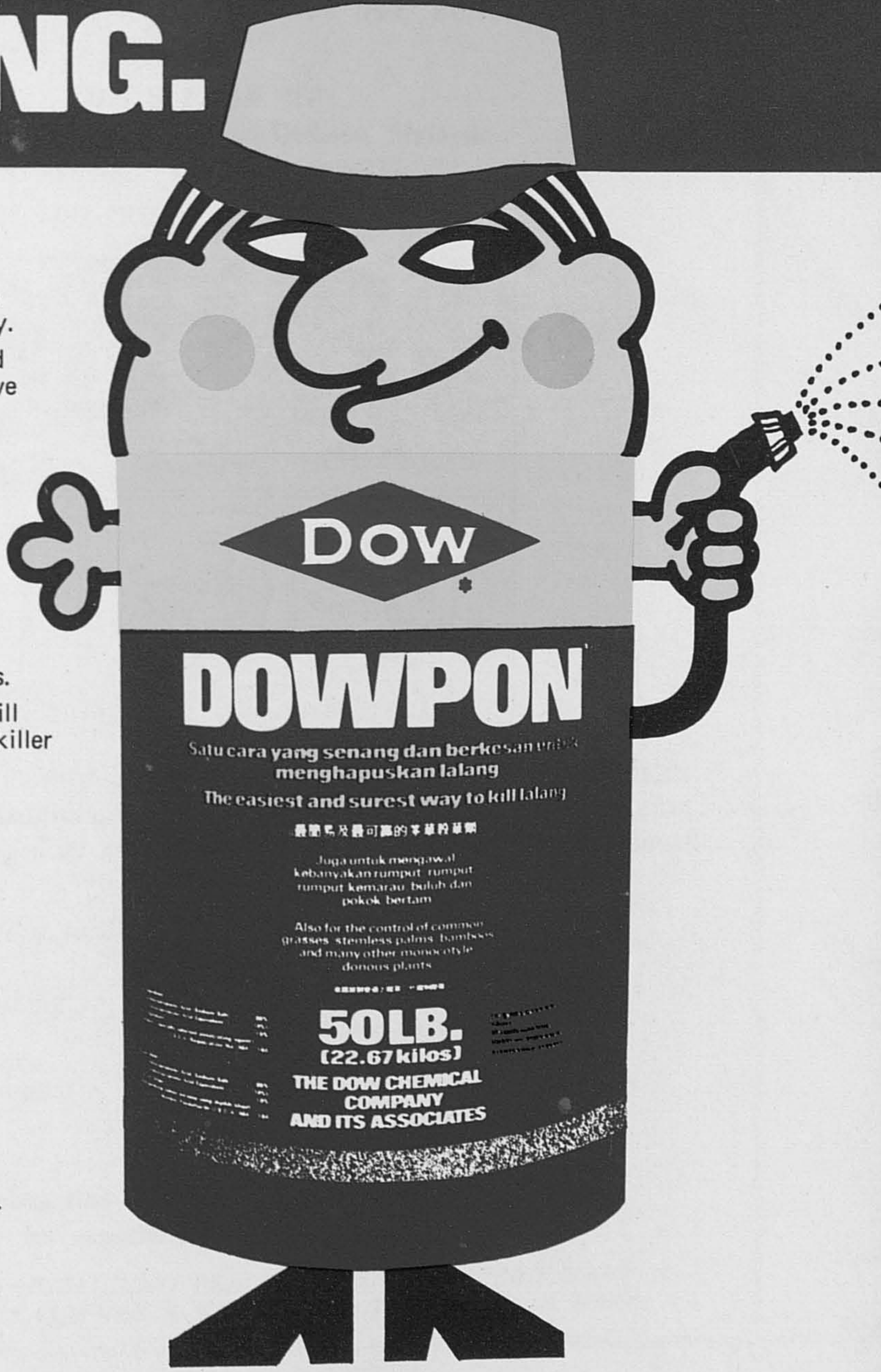

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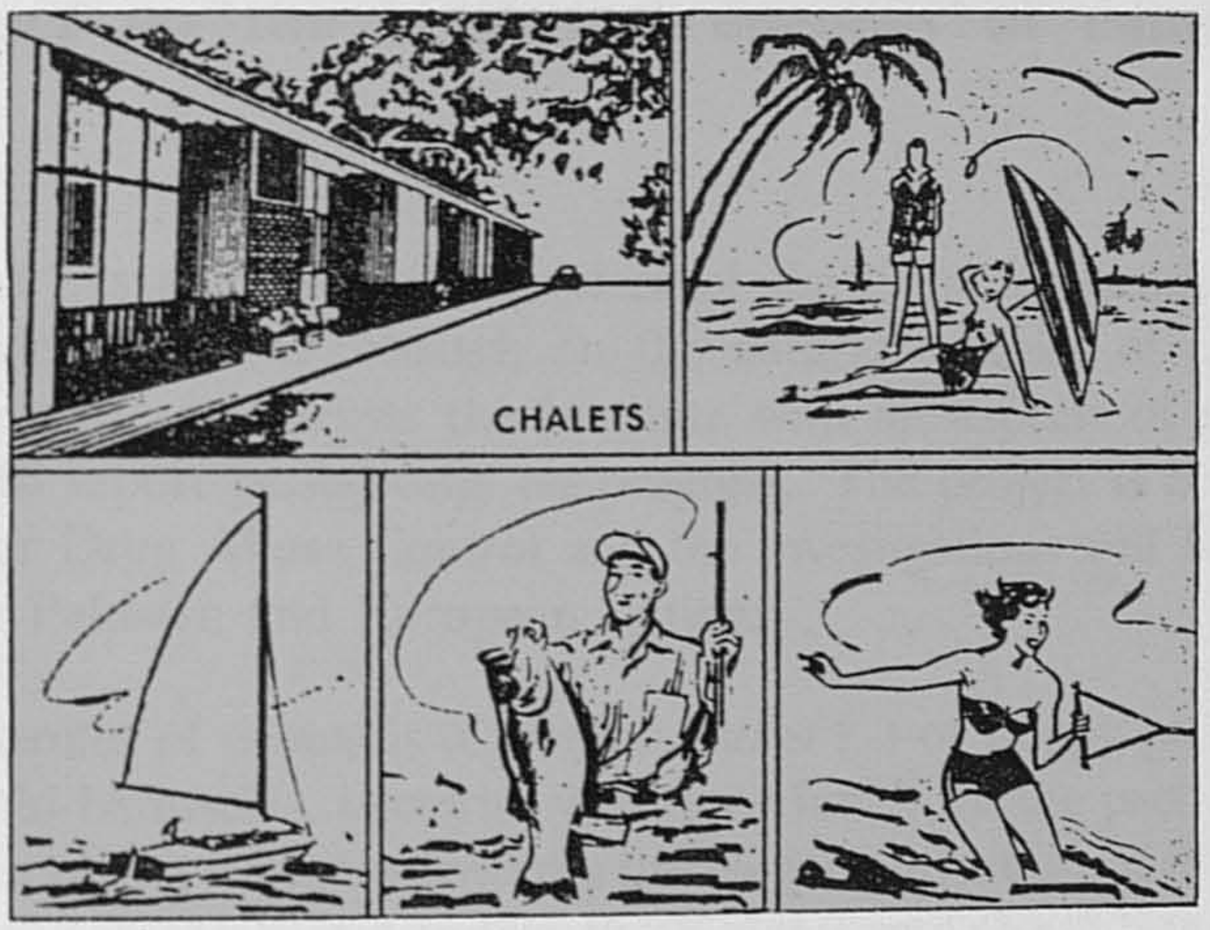

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WE HAVE EVERYTHING—INCLUDING PEACE AND QUIET IF YOU WANT IT—
WHY TRAVEL OVERSEAS WHEN EVERYTHING YOU REQUIRE IS HERE?

Let us at least start off with a listeners'/viewers' letters programme wherein the producers and/or planners publicly answer complaints, suggestions and criticisms—and hopefully, act on the valid ones. Surely the broadcasters themselves don't like working in a vacuum?

There must be a place in all walks of life for thoughtful and constructive criticism, otherwise we shall find ourselves accepting lower and lower standards in everything, the atrophy of critical faculties, and degeneration into a nation of vegetables.

Research project on the biological enemies of cannabis and poppy plants

The United Nations has employed the services of the Commonwealth Institute of Biological Control to carry out research on the natural enemies of cannabis and poppy plants. The contract entrusts the Institute with all aspects of this research and the Institute will report periodically on progress. The project is being financed by the UN Fund for Drug Abuse Control and the investigations will begin initially from the Institute's Pakistan and European stations.

The natural enemies of cannabis (*Cannabis sativa* L.) or poppy plants (*Papaver somniferum* L.) could be insects, bacteria, viruses or fungi. In the past decade there has been an ever-increasing tendency towards the illegal cultivation of the two plants. The epidemic increase in the illegal use of these plants and the substances derived from them made governments and scientists look for measures to combat this plague; one of them was the possibility of discovering and developing natural enemies of these plants which would attack them (and *only* them) in the areas of illegal production.

There is a variety of natural enemies which could ravage these two crops and it will be one of the primary tasks of the Institute to select those capable of damaging specifically cannabis and the poppy to an extent which would progressively destroy their illegal cultivation *without any hazard* to other plants and crops. In addition, the Institute will also investigate the effectiveness of these natural enemies when transferred to regions with different ecological conditions.

(adapted from *Tropical Science*)

Social and Personal

Award of Associate Diploma

Chong Tong Soo — (Central Johore)

Donations to Hostel Fund

H V Speldewinde	$100
Datuk R G Barrett	$100
M K Graham	$100
Tan Chong San	$53
Alexander Huang Tzin Tat	$30
Zakaria bin Othman	$40

EXAMINATION SUCCESSES

Agricultural Science — Soil Section

16 May 1973

Thomas Ong Hong Tong	(Selangor)	Passed

Estate Book-keeping

13 June 1973

Ong Guan Leong	(Central Johore)	Passed
Chong Tong Soo	(Central Johore)	,,
Chai Hon Chee	(Selangor)	,,
Khoo Khoon Long	(Negri Sembilan)	,,
B Allen-Edmett	(North Johore)	,,
Mu Chun Hain	(Sabah–Tawau)	,,

On leave

3745 Griffiths, R T, AISP, c/o 6 Oakwood Avenue, Walkden, Worsley, Manchester, England.

5773 Mahadevan, P, 211 Rasah Road, Seremban, Negri Sembilan.

4917 Ritchie, A J, AISP, 65 St Roman's Drive, Petercutter, Aberdeenshire ABI ORD, Scotland.

5829 Ng Hark Peng, 270 Brewster Road, Ipoh, Perak.

3410 Stimpson, K M S, 'Lerida', 11 Lundin Road, Crossford Fife, KY12 8PW, Scotland.

Returned from leave

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

5121 Garner, H, Merlimau Estate, Merlimau, Malacca.

3241 Stewart, J, B SC, OBE, Sarawak Oil Palms Sdn Bhd, P O Box 547, Miri, Sarawak.

4257 Thompson, J A, Sungei Samak Estate, Ulu Bernam, Perak.

5258 Crabb, M B, SDA, AISP, Chang Wing Estate, P O Box 512, Kluang, Johore.

Change of address

5214 Chan Siew Kong, Serapoh Estate, Parit, Perak.

5800 Chan Tho Lon, Sime Darby Plantations Bhd, P O Box 252, Kuala Lumpur.

5561 Chooi Chee Fai, Kalumpong Palm Oil Mill, Bagan Serai, Perak.

5593 Chuah Ewe Teik, Monsanto Far East Ltd, 116 Jalan Semangat, P O 1043, Petaling Jaya, Selangor.

5761 Inglis, A E, c/o Aluminum Bahrian, P O Box 570, Manama, Bahrain, Arabian Gulf.

5098 Ismaii bin Mohamed, Prang Besar Estate, Kajang, Selangor.

5884 Lau Kok Chin, Sungei Samak Estate, Ulu Bernam, Perak.

5626 Lee Hok Leng, Anthony, Dow Chemical Pacific Ltd, P O Box 711, Hong Kong.

5029 Lim Cho Yam, AISP, 38, Jalan SS 3/60, University Garden, Sungei Way, Selangor.

5933 Louis, P C, 3, Jalan 5/19C, Petaling Jaya, Selangor.

5442 Nair, Balakrishnan, Bukit Peninjau Oil Palm Scheme, P O Box 661, Miri 4th Division, Sarawak.

5905 Ooi Kiam Hak, Bukit Paloh Estate, Paloh, Johore.

5358 Tang Sew Hon, AISP, Jendarata Estate, Teluk Anson, Perak.

5693 Watson, E, Lembaga Kemajuan Tanah Sarawak, Lubai Tengah Scheme, P O Box 92, Limbang, Sarawak.

4250 Ahmad Zakaria b Abu Kassim (Hj), PJK, Sogomana Estate, Pantai Remis, Dindings, Perak.

5643 Fernandez, E, Kepong Estate, Kepong, Selangor.

4717 Irvine, N, Sabai Estate, Karak, Pahang.

5170 John, Jayaraj S, Connemara Estate, Jalan Bangi, Semenyih, Selangor.

5485 Koh Boon Hua, 96 Taman Kangar, Kangar, Perlis.

5692 Kong Fook Quin, Semporna Island Settlement Scheme, P O Box 117, Semporna, Sabah.

5189 Lim Teik Moh, Timothy, Sungei Kruit Estate, Sungkai, Perak.

3915 Longmore, W A J, Kuala Reman Estate, Kuantan, Pahang.

4160 Lumsden-Bedingfeld, R W, Church Farm, Necton, Nr Swaffham, Norfolk, England.

5660 Lye Soo Lee, Kuala Haw Estate, c/o Pasir Gajah Estate, Kuala Krai, Kelantan.

5553 Lopez, J, Bukit Rajah Estate, Klang, Selangor.

4997 Montgomerie, J, NDA, MRAC, AISP, Kinta Kellas Estate, Batu Gajah, Perak.

5632 Singh, Jagjit, Guthrie Trading (M) Sdn Bhd, 17 Jalan Semangat, Petaling Jaya, Selangor.

5104 Subramaniam, S, Seafield Estate, Batu Tiga, Selangor.

4655 Turnbull, G H, AISP, Kempas Klebang Estate, Paloh, Johore.

Birth

SILVESTER: To Rose and Robert, a daughter Rosalind Karen, on 12 June 1973, at Penang Maternity Hospital.

Deaths

BISHOP: R O Bishop, FISP, in Spain on 7 February 1973.

MENDELSOHN: Suddenly at Malacca on 20 July 1973 Gerald, Manager, Sungei Bahru Estate, Mesjid Tanah, Malacca.

CAMPBELL: Tan Sri H A Campbell, PMN, CBE, FISP, formerly Managing Director of Socfin Co Bhd, passed away in Blairgowrie (Scotland) on the 21 July 1973, aged 70.

Chicken Vindaloo

Ingredients

1 chicken
8 onions
7 tomatoes
2 tablespoons vinegar
½ teaspoon turmeric powder
2 tablespoons cooking oil
salt to taste

Grind in a blender

1 teaspoon cummins
2 teaspoons mustard seeds
4 pips garlic
2 in. piece ginger
5 cloves
5 peppercorns
1 stick cinnamon
5 dried red chillies
1 stalk curry leaves

Method

Rub meat with the ground mixture, salt and turmeric powder.
Heat the oil.
Fry the onions until glassy.
Add the meat and remaining ingredients.
Stir well over high flame for 3 minutes.
Add ½ cup water and cook over low fire.
Add more water if necessary.
When meat is tender and gravy almost dry, remove from fire.
Serve with rice.

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Shell Lalang Oil: the quickest, surest way to wipe out sporadic lalang.

You can easily spot the live green lalang from the dead ones.

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And lalang just wiped with the oil will positively glisten in sunlight. So there's no chance to wipe Shell Lalang Oil twice on the same lalang. There's no wastage. Supervision is easy because you'll know for sure, if any wiping has been done.

And that's how to wipe out the sporadic lalang menace. Quickly. Economically. Surely. And with minimum labour.

Talk it over with your Shell Chemicals man. He can give you all the details about Shell Lalang Oil.

And remember: if it's a chemical—or you think there may be a chemical to help you—call Shell Chemicals.

L 11

Shell Chemicals

Years of persecution have made weeds sneaky!

If you have the feeling the weeds on your estate wait until you turn your back, then take over while you're not looking.... you're right. They do.

You need the kind of help we can offer. Our experts know all the weeds here. And how to mix a chemical "cocktail" that'll knock them out cold. For a long time.

We have **Shellapon** to destroy sheet lalang and **Shell Lalang Oil** for effective eradication of sporadic lalang. Down to the tips of the roots.

Our **Shell Amine 80** will wipe out broad-leafed weeds— though we don't recommend it around oil palms.

We have **Tenac** to make sprays stick and **Teepol** to make sprays spread.

We have **Diurex 1000, Shell MSMA** and **Ronmax 312** to complete your "cocktail" cabinet.

There isn't a weed smarter than these herbicides.

Call us to advise you on the "cocktail" mixture for your estate that will be the most effective and the most economical.

If it's a chemical – call Shell Chemicals.

Shell Chemicals

Mikania and Paspalum creep over the clear space between young rubber trees.
Shell Chemicals can supply a "cocktail" for these weeds — and even the knapsack sprayer to spray it!