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A NOTE ON THE MARKET FOR PYRETHRUM[1/]

by

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1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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CONTENTS

This paper is a summary of an interim report on the market for pyrethrum which was recently prepared by the Tropical Products Institute.

INTRODUCTION

The pyrethrum plant contains in its flowers substances which are poisonous to insects. These substances are known as pyrethrins. The most important commercial characteristics of this insecticide are its ability to produce rapid knockdown, its low mammalian toxicity and its lack of persistence. It also has flushing out and repellant properties and can achieve a moderate kill.

To the less developed countries, the value of pyrethrum growing is twofold: It is a foreign exchange earner to the exporting countries of Kenya, Tanzania, Rwanda, Ecuador and New Guinea and, to a lesser extent, to Peru, Yugoslavia and Bolivia and a foreign exchange saver in the other producing countries, Brazil, India and Morocco. It is most important as a foreign exchange earner to Kenya, for whom it represents almost 5% by value of its total exports.

In addition pyrethrum is a useful cash crop for the highland areas of the less developed countries where it is grown. It is expecially suitable because harvesting is labour-intensive and extends throughout most of the year, and because it can be grown on smallholdings. UNIDO have already recognised its possibilities by supporting the emergent industry in Rwanda. It is possible that their investment will not prove fruitful, not because their project is not viable in local terms, but because technical innovations in the developed countries may undermine the export market.

CHAPTER I

SUPPLY

World pyrethrum production has shown an upward trend in the decade from 1962 to 1971, although output has varied considerably from year to year. Table 1 on page 23 shows world production between 1962 and 1972 by producing countries. Supply has constantly been out of balance with demand, moving in a repetitive cycle from surplus to shortage. By 1963, large stocks had built up in Kenya, the major producing country, and production in 1964 was cut by half from the 1962 level. Further years of low output in Kenya produced a world shortage. Production then recovered in Kenya, at the same time as it peaked in other producing countries and the cycle started again with a surplus position in 1968. On this occasion, the cuts in production spread world-wide as export prices were reduced. The low point was in 1970 when world production was 11780 tons, a similar figure to the low point in the previous cycle of 11700 tons in 1964. On the current upswing, production in 1972 reached 21930 tons, which exceeded the previous high points in 1967 and 1968 by 1000 tons.

Kenya maintained its position as the leading producer country, contributing over 50% of world output in all but three lean years. Tanzania became the second largest producer during the period under review, more than doubling its output but producing about half the volume of Kenya. The pyrethrum industry in Japan continued to decline and, in Ecuador, initial progress was not sustained in the face of adverse conditions. Amongst the smaller producers, Rwanda staged a steady recovery after a setback in the early 1960s and is now the third largest producer. The pyrethrum industry in Zaire appears to have collapsed after independence and the experiment of launching a pyrethrum growing industry in the Highlands of New Guinea has not been successful for social as much as economic reasons.

The smallest producers use most of their production domestically, whereas the countries mentioned above export almost all their production and their output reflects, therefore, their contribution to the world export availability.

The dominance of Kenya in the world export trade means that any variation in Kenya's production affects the world export availability. This creates unique problems and responsibilities for Kenya. A surplus or shortfall in its production requires a compensatory and opposite movement in its production in the following year or years. It also means that variations in Kenyan production affects the market for other producers more than variations in their own production. In the longer term, the growth of pyrethrum production in other countries must be aligned to the plans for pyrethrum production in Kenya in order to establish a satisfactory balance of supply with demand.

Prospects for Supply

It is extremely difficult to project forward the pattern of production with any confidence. The weather, as always, is an unpredictable variable and the short period of maturation of the pyrethrum plant makes possible rapid and large changes in the size of production. The cyclical pattern of production in the past reveals the tendency of supply to get out of step with demand and its sensitivity to resultant changes in price. It is therefore advisable only to indicate possible upper and lower limits for production in the future.

Assuming the most favourable demand conditions and the complete fulfillment of production programmes, the potential production in 1975 could be as high as 29000 tons, of dried flowers which is made up as follows:

Kenya	17500 tons
Tanzania	6000 tons
Rwanda	2500 tons
Japan	700 tons
New Guinea	300 tons
Ecuador	1000 tons
Other countries	1000 tons
Total	29000 tons

On the other hand, in the event of unfavourable market conditions and problems in the producing areas, produotion could be very much lower. In the past production has shown a downward potential of almost 50% below its peak, with the largest produoers showing even greater reductions in production. The small produoers would however be affeoted by a deoline in the world price, which would further undermine the export pyrethrum industries of, in particular, Japan, New Guinea and Ecuador, and could lead to their extinction.

The competitive position of pyrethrum could be improved by reducing the oosts of growing and prooessing. Kenya is making great efforts in this direction by enoouraging the planting of high yielding and high pyrethrins oontent plants and by improving the effioiency of the oo-operatives management. There appears, however, to be limits to the progrese that oan be made, as plants with a pyrethrins oontent above 1.5% tend to be low yielders. Any savings in oosts, which are gained, may be more than offset by increases in the wages of labourers, to whioh pyrethrum growing is extremely vulnerable as it is labour intensive. The industries in Ecuador and New Guinea have already felt the impact of the increasing oost of labour with disasterous results and there are reports that labour in the main pyrethrum growing areas in Kenya is beoming soaroe and more expensive.

Exports

The major producing countries, with the exception of Japan, are not significant consumers of pyrethrum. Exports have therefore followed the general trend of production. However, export levels have not varied quite so sharply as output, as sales have lagged behind production in years of plenty and the resultant surplus stocks have been carried forward to alleviate in part the shortage in years of low crops. It has been the intention of the Pyrethrum Board of Kenya to build up a strategic stock to absorb its own surplus supplies in times of high production and to ensure sufficient supplies in times of shortage, but in recent years there has been no surplus production from which to build a stock. They are planning to divert some of their increasing output in future years into stocks to be held in consuming areas.

The overall trend in exports over the last decade has been upwards. Table III overleaf shows total exports from producing countries. Between 1962 and 1965, exports averaged about 600 tons in terms of 25% pyrethrins content extract. In 1966, exports increased by about 100 tons and averaged about 780 tons between 1966 and 1968. In 1969, exports reached 828 tons, despite reduced production. Since 1969, the main constraint on the growth of exports has been the shortage of supply. In the 1969/70 crop year, the Pyrethrum Board of Kenya was able to meet only 60% of its buyer's requirements and despite a large increase in production was able to fulfil only 70% of its sale orders in 1970/71. Total exports from producing countries fell to 590 tons in 1970, recovering to 756 tons in 1971 as production picked up again. The 1972 exports figures will show further progress towards the 1000 ton mark.

TABLE III

Exports of pyrethrum (in terms of 25% extract) from the main producing countries

Year	Metric Tons
1962	564
1963	620
1964	594
1965	643
1966	743
1967	799
1968	789
1969	828
1970	590
1971	756

Source: National Export Statistics

An increasing proportion of exports have been in the form of extract instead of the traditional form of dried flowers. This has been made possible by the development of extraction capabilities in the producing countries. Kenya entered the 1960s with two extraction plants, but other producers were not well equipped with extraction facilities. Tanzania's first extraction plant was opened at Arusha in 1962. Exports of flowers dropped immediately to a low level and although they recovered slightly in the mid 1960s they never exceeded 20% of total exports in terms of pyrethrins content. In Ecuador, exports of extract increased when a second extraction plant was erected but it was not until 1966 that flowers were replaced as the major form of export. Today, all the producing countries with the possible exceptions of Morocco, Yugoslavia and Bolivia have extraction facilities of some kind.

The advantage to the producing country of exporting extract rather than flowers is that it has a higher value per unit of pyrethrins, earning more foreign exchange. It is also a high value, small-bulk product, unlike dried flowers, and it is economic to air freight it.

In Kenya, there has also been a trend towards refining of the extract and grinding of the flowers into powder before export. An increasing proportion of Kenyan exports of extract are no longer crude oleo-resin, but partially dewaxed or wholly dewaxed or dewaxed and decolourized extract. At the present time, Kenya is the only producing country with refining facilities but a unit is being built in Rwanda.

PRICING

Kenya, as the produoer of over half the world's total export availability, dominates the supply of pyrethrum to world markets and acts as a price leader.

Movements in the export prices of pyrethrum have been infrequent and small; Table IV below shows the prices of pyrethrum flower, powder and extract in the USA over the last decade. The largest single price movement was a reduction of 11% in July 1968. Since then, it has been the polioy of the Pyrethrum Marketing Board of Kenya to hold the export price despite the severe shortage of supply. The implication of the Pyrethrum Board's policy of not making large or frequent prioe ohanges is that they consider that demand is fairly inelastic. In this, they are probably correct, but the result has been that in years of bumper crops, large stocks have built up. In an attempt to restore the equilibrium between supply and demand, major changes in the volume of production have been induced by fairly large changes in the prices paid to the growers.

TABLE IV

Prices of Pyrethrum in the USA (US cents per lb)

Date of change in price	Flowers (0.9% Pyrethrins) Delivered	Powder (1.3% Pyrethrins) Delivered	Extract (20% Pyrethrins (dewaxed) ex-works
Feb 1964	0.50	0.71	11.00
June 1965	0.53	0.78	11.00
August 1966	0.57	0.81	11.30
July 1968	0.52	0.75	9.75
Feb 1972	0.52	0.75	10.00

Source: Oil, Paint and Drugs Reporter

CHAPTER II

CONSUMPTION

IMPORTS

Three countries have imported between 57 and 72% of world exports of pyrethrum in the last ten years to 1971. They are the United States, the United Kingdom and Italy. Table V below sets out their respective shares of the world market.

TABLE V

The Percentages of world exports of pyrethrum shipped to the three leading importing countries

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
USA (%)	49	36	37	45	49	38	31	39	38	37
UK (%)	11	12	16	16	17	23	23	18	9	15
Italy (%)	6	9	4	7	6	6	7	5	7	6
Combined market share of USA, UK and Italy (%)	66	57	57	68	72	67	61	62	54	58

Source: National export statistics of producing countries

The USA is the major importer of pyrethrum, accounting for between 31 and 49% of world exports. In the last five years, its share has averaged 37%. Imports of pyrethrum into the UK increased steadily up to 1968, when they reached 23% of world exports. Thereafter imports dipped sharply as a result of the shortage of supply, but are now recovering. Italy is the third largest user of pyrethrum, although its imports have averaged only 6% of world exports.

Other countries

Other European countries account for 6 or 7% of pyrethrum exports, but they also receive refined and formulated products from the United Kingdom and re-exports from Italy. The most important direct importer has been France, but its imports appear to have declined over the last two years.

South East Asia is the major market for pyrethrum flowers and powder; Thailand is the largest importer, followed by Japan, Malaysia, the Phillipines and Hong Kong, but they account for less than 10% of total exports.

The picture is complicated by the dual role of Japan as importer of flowers and small quantities of extract and as an exporter of flowers and 'extract'. Since 1969, Japanese exports of flowers and 'extract' have exceeded its imports. In value terms, however, Japan is a net importer because of the large quantities of marc it imports for use in mosquito coils.

Trade within the producing areas of Africa and South America is at a low level. Argentina is the only large consumer of pyrethrum without its own growing industry.

The two most populous states in the world, India and China, use only small quantities of pyrethrum.

CONSUMPTION TRENDS

The main markets for pyrethrum are in developed countries in aerosols and fly sprays for use in the home. It is estimated that about 80% of pyrethrum is used in this way.

The increasing use of aerosols was no doubt responsible for the growing demand for pyrethrum in the early and mid 1960s. In recent years, the sales of insecticidal aerosols have tended to level off in the USA and Europe, indicating market saturation. Despite this, the demand for pyrethrum has increased very sharply over the last five years. In 1968 total consumption of pyrethrum was equivalent to about 17000 tons of dried flowers, which was about 3000 tons short of actual production, and yet, by 1970, demand had risen to an estimated 16000 tons and, by 1971, was probably 20500 tons. Actual supplies in 1970 and 1971 were only about 13000 and 16000 tons respectively. In 1972, production of pyrethrum rose to 22000 tons and demand and supply were reported to be approaching a balance. Thus, demand has increased by about 30% in four years or about 7% per annum.

This increase was related to the restrictions placed on the use of organochlorine insecticides and the resulting need for less persistent insecticides with low mammalian toxicity to replace them. The environmentalists campaign against persistent and toxic insecticides was sparked off by Rachel Carson's book "Silent Spring", published in 1962, but it was some time before there was any official response.

From 1969 onwards, increasingly tight restrictions were introduced in the USA and Europe on the use of organochlorines in the home: the use of dieldrin and DDT, amongst others, was banned in the home (and in the garden in the UK) and the use of lindane and chlordane in thermal vaporizers stopped. DDT and Lindane had been used in aerosols and fly sprays to boost the residual killing power of pyrethrum. When DDT was banned, the usage of pyrethrum was increased as it was known by long use to be safe. The use of lindane and dichlorvos, an organo-phosphate, although still permitted, has been discouraged by the general concern over the use of toxic and persistent insecticides.

The substitution effect of pyrethrum for organochlorines and dichlorvos appears to have been restricted almost entirely to the traditional areas of pyrethrum usage, although the need for less peristent insecticides with a low mammalian toxicity extends into the agricultural, horticultural and forestry fields. The future growth of demand for pyrethrum would appear to depend on its extension into these fields as the substitution effect in the home, which has been operative over the last few years, must shortly work itself out.

The use of pyrethrum outside the home is presently very small. Pyrethrum sprays and powders are used in the domestic garden on ornamental shrubs and against insects on fruit and vegetables. In horticulture, they may be used to clean up a crop, that is to remove insects, immediately before it is harvested and marketed. For this, pyrethrum is ideal as it has a wide spectrum of activity and it degrades in sunlight with one or two hours of application. It is, however, this lack of

persistence, which prevents its wider use. To afford a crop continuous protection with pyrethrum, repeated applications are necessary, which is not economic with such a high price commodity. Instead, organophosphorus insecticides or carbamates are used as general purposes insecticides in agriculture as they provide a longer, but limited effectiveness, and are cheaper. They are also established in the stored products field to the almost complete exclusion of pyrethrum.

The introduction of ultra low volume (ULV) techniques has been heralded by some parties, notably the Pyrethrum Board of Kenya, as the vehicle for achieving a break-through for pyrethrum into the agricultural, horticultural and forestry fields. The ULV technique can be applied through either aerial spraying or ground-based equipment. The quantity of insecticide used is greatly reduced: in one application on a forest in Minnesota, only 0.1 lb of pyrethrum per acre was used. At these concentrations pyrethrum can be economic, in certain uses, especially where the danger of drift into populated areas makes a safe insecticide essential.

However, the use of pyrethrum in ULV is still in the experimental stage and its lack of persistence is a major problem. The ULV technique, itself, is only beginning to be established in the USA and is not widely used elsewhere.

Another potential growth area for pyrethrum are the less developed countries. Their usage of pyrethrum is relatively small at present. The main outlet is in mosquito coils. Pyrethrum has been shown to be extremely effective against mosquitoes: not only does it paralyse and kill, but it also has a repellent effect and may inhibit biting. In the home, there is considerable scope for increased use of pyrethrum based formulations, but while average personal income remains so low there is little likelihood of this demand being realized. In the agricultural and health fields, the less developed countries have moved more slowly in restricting the use of organochlorines, presumably because of the latters' great effectiveness and economy.

CHAPTER III

SYNTHETIC PYRETHROIDS

The Development of Synthetic Pyrethroids

In these traditional and new usages, pyrethrum now faces the competition of a new generation of synthetic pyrethroids.

Research into the production of synthetic pyrethroids has found its main incentives in the character of the pyrethrum producing industry: the high cost of pyrethrum limits its uses and makes costly investment in the research and development of synthetic pyrethroids potentially profitable; the supply of pyrethrum is uncertain from year to year as a result of erratic and unpredictable variations in the level of production and the concentration of production in East Africa and in Kenya, in particular, is a cause of concern to formulators who are placed in a weak bargaining position and who fear that political upheavals in East Africa could cut off their main source of supply. Interest in the pyrethroids has also been stimulated by public concern over the pollution of the environment by persistent and toxic insecticides.

The synthetic pyrethroids which are commercially available at the present time, fall into one of two categories: they have either a good kill and a poor knockdown or they have a poor kill and a good knockdown. These categories represent different types of competition for pyrethrum.

The pyrethrins would be classed in the second category of good knockdown and poor kill.

Degree of substitution of synthetics for natural pyrethroid

The market penetration of the synthetic pyrethroids was greatly assisted by the shortage of pyrethrum at a time when the demand for non-toxic, non-persistent insecticides was growing. Between 1969 and the end of 1971, available supply of pyrethrum was only able to satisfy between 60 and 70% of demand. This shortage overcame the normal reluctance to change, which is caused as much by inertia as by cost considerations. Formulators were obliged to experiment with and to introduce

synthetic pyrethroids to ensure that they were not left short of raw materials for the growing pyrethroids market.

In the long run, it is believed that the shortage of pyrethrum will be seen as affecting the rapidity of the market penetration of the synthetic pyrethroids rather than the ultimate degree of substitution of synthetic pyrethroids for natural pyrethrins, for it is economic at current prices to substitute synthetic pyrethroids in some uses. Some formulators have claimed savings of up to 25% on the cost of aerosol formulations, without loss of effectiveness, by mixing the complementary properties of the good kill of resmethrin or bioresmethrin with the good knockdown of pyrethrins. This leaves pyrethrins competing with the 'good knockdown' pyrethroids to provide the knockdown effect. These latter synthetics may be marginally more economic where a limited degree of knockdown is acceptable, but over the broad medium to good knockdown range, pyrethrins are reported to be more economic at present.

Pyrethrum is effective against a wider range of insects and in a wider range of applications than any other pyrethroid. This may be a desirable property in less developed countries, but it is unlikely to be commercially significant in the major markets of the USA and Europe where the formulating techniques are sophisticated, and the marketing of aerosols tends to be selective.

In mosquito coils, the synthetic pyrethroids, mainly allethrin, already have the major share of the market, as much as 90% of it according to one synthetic pyrethroid manufacturer. This may be explained by the importance in the mosquito coil business of Japan, which is also the major producer of allethrin.

In the long run, the most important consideration in determining the usage of the various pyrethroids will be their relative cost effectiveness. The competitiveness of pyrethrum will be reduced, if, as seems likely, the price of the synthetic pyrethroids is cut as the volume of the production is increased and economies of scale come into play. At the present time, manufacturers of synthetic pyrethroids are probably keeping their prices high to recover the initial investment in research

nd development which can amount to between one and seven million dollars for each new product. There have already been some small reductions in the prices of the synthetic pyrethroids and the scope for further reductions may be greater in the next two or three years.

It is difficult to estimate the existing degree of market penetration of the synthetic pyrethroids, because official statistics for the quantities produced are not available. Such information as is available indicates current levels of production as follows:

Resmethrin and bioresmethrin (100% active)	10 to 20 tons pa
Bioallethrin (93% active)	20 tons pa
Tetramethrin (90% active)	80 tons pa
Allethrin (90% active)	100 to 250 tons pa

To obtain a comparable figure for pyrethrins it is necessary to work from the production of pyrethrum flowers, which was in 1972 about 22000 tons. Assuming that these flowers had a pyrethrins content of 1.25% on average this would give a figure for pyrethrins equivalent to 90% extract of about 300 tons.

The usage of synthetics is much higher in mosquito coils than in other uses. It is probably true that allethrin is used mainly in mosquito coils[1] and that about 10 per cent of pyrethrum is used in mosquito coils and creams. The balance of the pyrethroids, 270 tons of pyrethrins and 110 tons of synthetic pyrethroids, would be used mainly in aerosols and sprays.

The penetration of the synthetic pyrethroids varies not only with end use but also between markets. In Japan and South East Asia, the usage is high, due to the quantity of allethrin in mosquito coils. Sumitomo Chemicals of Japan not only produce allethrin, but are also the producer of tetramethrin under their brand name, neopynamin. Sales of tetramethrin have been small, to date, in the other main markets of the USA and Europe, although

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[1] Allethrin has been used in aerosols in the USA in particular by the US armed forces.

the producers expect to make fairly rapid progress. Sales in Europe were reported to be 3 tons in 1970 and 5 tons in 1971 and the forecast for 1972 was 15 tons. In the USA, FMC only received safety clearance in 1972 for their product, containing resmethrin and tetramethrin. Resmethrin and bioresmethrin are now in production in both the USA and Europe. Usage of synthetic pyrethroids, excluding allethrin, in 1972 is estimated at about 10 tons in the USA, compared with an estimated 120 tons of pyrethrins. In Europe, the usage of synthetics is probably higher, around 35 tons compared with about 70 tons of pyrethrins.

Growth of synthetic pyrethroids share of the market will not be restrained by shortages of supplies; indications are that plants are working well below capacity at present. It is possible that production could double in the next three years and double again within five years, although this may be in terms of insecticidal efficiency rather than in terms of tonnage. FMC predict that in the USA the synthetics will secure 25% of the total pyrethroids market in the next three to five years. In five years' time it seems likely that even more effective insecticides with pyrethroid characteristics will be available. Intensive research is currently being undertaken into producing a pyrethroid insecticide with greater persistence, which would make it economic for agricultural uses. This might well prevent the further development of pyrethrum into the fringe agricultural and forestry uses, into which it is now making some progress.

HAPTER IV

ONCLUSIONS

Over the last decade, the demand for pyrethrum has been growing but has been price inelastic; on the other hand, supply appears to have been fairly elastic and pyrethrum production has shown a cyclical pattern, while following an upward trend over the longer term. Since 1970, production has been on the up swing of the latest cycle. During this period, supply has fallen short of demand, but by the end of 1972, when world production reached 22000 tons of dried flowers, supply and demand were approaching a balance.

There is now a danger that supply will move ahead of demand over the next few years. It has been estimated that the maximum world production of pyrethrum in 1975 could be as high as 29,000 tons of dried flowers. To this must be added the increase in the production of newer synthetic pyrethroids, which could double in production adding 100 tons of active pyrethroids to the total pyrethroids market. Allethrin production seems unlikely to grow if pyrethrum is more readily available and the newer synthetics are experimented with inanti-mosquito formulations. Even so, to absorb the additional quantities of pyrethroids indicated above, demand would have to continue to increase at a similar rate to its growth over the last four years.

It is felt that demand will not maintain this rate. The main spur to the demand for pyrethroids over the last four years has been the restrictions placed on the organochlorines and DDVP, but the effect on demand of the substitution of pyrethroids for these other insecticides in the home and garden must be expected to work itself out shortly, if it has not already done so. Future growth in demand in the developed countries will depend on population growth and an extension of pyrethroid usage into new fields. The most promising appear to be horticulture and forestry. Taking a very long term view, the best prospects for increased demand may be in the less developed countries. However, over the next five years none of these factors are expected to have any great impact on demand.

In the event of an excess supply of pyrethroids, it seems likely that some pyrethrum would be surplus to requirements in view of the expectation of a substantial substitution of synthetic pyrethroids for pyrethrum. This trend would be intensified by any reduction in the price of the synthetic pyrethroids.

On the basis of past experience, a surplus of pyrethrum results in a sharp fall in the price paid to the growers and a subsequent reduction in their crops. In other words, it triggers off the start of a new production cycle. It remains to be seen whether the Pyrethrum Board of Kenya would be able to absorb sufficient supplies into their proposed stockpiles to prevent the market becoming depressed. To operate such a stockpile successfully requires large financial resources. Should pyrethrum production decline again, the newer synthetic pyrethroids, which can be manufactures more or less to order, would be in a better position to seize a larger share of the pyrethroids market than in the late 1960's and early 1970's, because they will have become better known and their production will be on a larger and possibly more economic scale.

The prognostication outlined above represents the most unfavourable course of events that could befall the pyrethrum growing industry. It is quite possible that the production of pyrethrum will not increase as rapidly as is possible due to problems in producing areas and that the synthetic pyrethroids will not make such good headway now that pyrethrum is more readily available. Both these factors would help to reduce the likelihood of a surplus of pyrethrum and the resultant pressur on prices. It seems to us that the pyrethrum growing industry would enjoy a longer period of profitability if they moderated their production aims and simply maintain the current world production level. However, the balance of probabilities is that pyrethroid production will be in excess of demand by 1975 and that the synthetics will make some progress at the expense of pyrethrum. The market is in a state of flux and it is for this reason that this note should be regarded as

an interim report. Key issues, which are yet to be resolved, are the ability of pyrethrum growers to reduce their unit costs, the scope for price reductions in the synthetic pyrethroids and the progress of research into new, more effective and more persistent synthetic pyrethroids. The long term market prospects for pyrethrum will be determined by the outcome of these issues.

Developed countries, which are the main markets for pyrethrum, might consider what assistance they can offer this industry as it meets the challenge of the synthetic pyrethroids. UNCTAD III made some suggestions, which are pertinent to the plight of pyrethrum. In resolution No 50 on the 'Competitiveness of natural products, synthetics and substitutes', which was adopted without dissent, UNCTAD requested, ex alia:

"The developed countries ... and the appropriate regional and international institution to provide financial and technical assistance to support:

(i) ... research and development projects of interest to developing countries for natural products facing competition from synthetics and substitutes;

(ii) Trade promotion and marketing of natural products by developing countries;"

As far as I know, pyrethrum does not receive any promotional or marketing assistance on a commodity basis from an international institution or from developed countries. Trade promotion has tended to be carried out exclusively by the Pyrethrum Board of Kenya in conjunction with its distributors. The most valuable form of financial assistance the UN could offer would be with regard to the sorely needed buffer stocks.

UNCTAD III also

"Urges countries producing natural materials threatened by competition from synthetics to co-operate for the purpose of:

a. Preparing and implementing long-term strategies and related comprehensive programmes of research, development and promotion for those materials, either through existing international bodies or, if need be, through new bodies which might be established for this purpose with the assistance, as necessary, of UNCTAD, FAO, UNIDO ..."

The need for co-operation amongst producers has already been emphasised in this paper. The market of every exporter of pyrethrum is affected by the level of production and pricing policy of Kenya. Comprehensive and continuous market analysis is especially necessary to achieve the optimum level of world output as the synthetics become more commercial. With regard to this, another part of the resolution is relevant, UNCTAD

"Urges all countries concerned to c-operate with UNCTAD, F.O and other competent international organizations to provide relevant information available to them on synthetics in order to facilitate study of the problems facing natural products".

TABLE I

World Production of Pyrethrum (Dried Flowers) (Metric Tons)

Countries	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Kenya[1]	10931	8511	5269	6256	7875	10698	11236	7423	5910	9748	14414
Tanzania[2]	1890	2250	2290	2942	4153	5970	5184	4833	2416	2665	4277
Japan	2300	1300	1600	1500	1200	1000	800	700	700[e]	700[e]	700[e]
Ecuador	500	1100	1800	2000	1800	1900	1900	1700	1300	858	637
Rwanda	430	337	340	470	396	52[illegible]	432	524	556	865	1200[e]
New Guinea[3]	-	-	-	-	100	568	530	400	400	400	400[e]
Zaire[3]	100	100	100	250	...	...	400	200	200	100	...
Others[4]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]	300[e]
TOTAL	16451	13898	11699	13718	15824	20956	20782	16080	11782	15636	21928

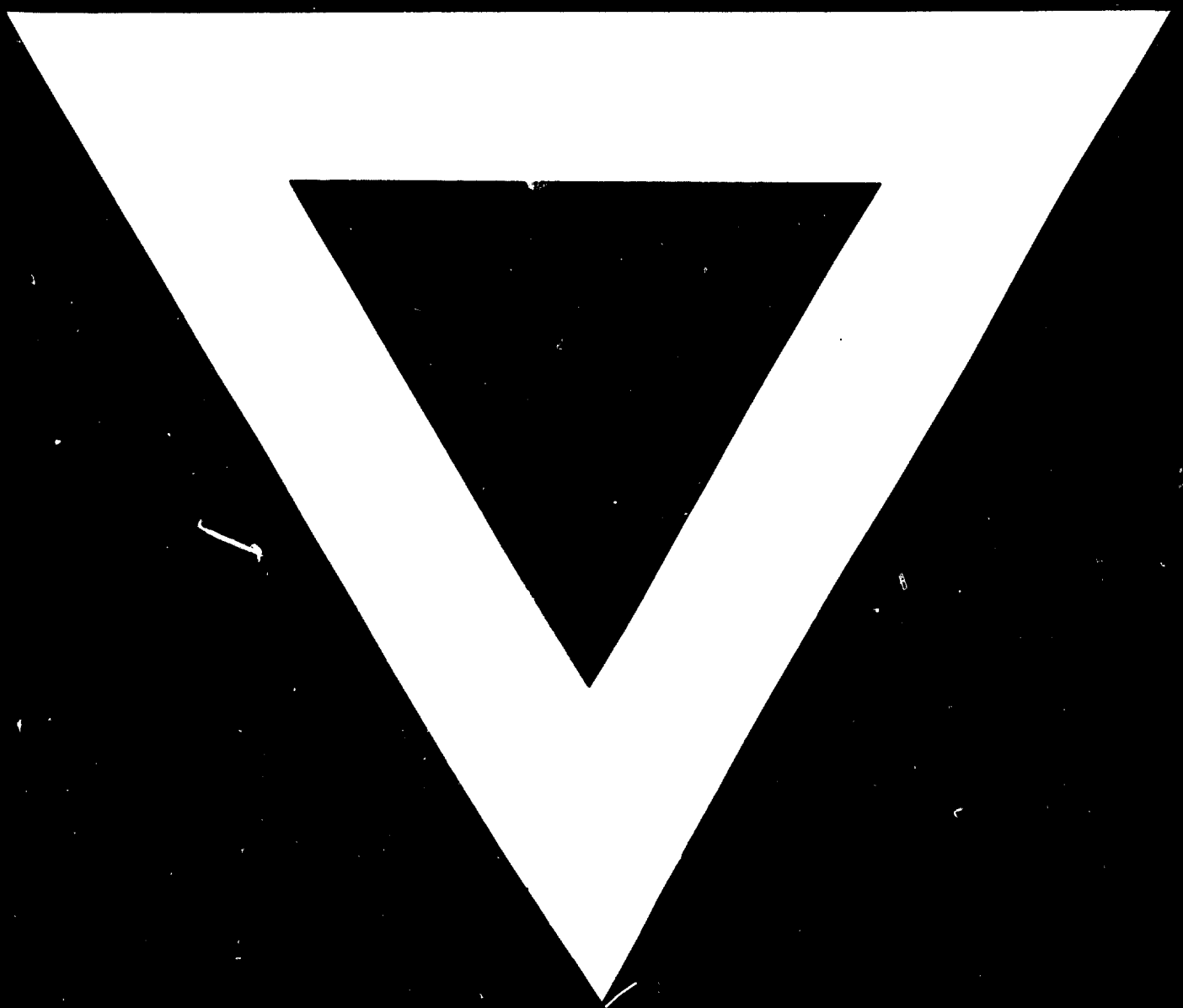
- Nil or negligible ... not available e TPI estimate

1. 1962 to 1964 represent crop year July to June, shown under second year; 1965, crop year July 1964 to September 1965; 1966 onwards, crop year October to September.

2. Up to 1964, calender years; 1965 onwards represent crop years July to June shown under second year.

3. Production figures estimated from export statistics by TPI.

4. Includes Peru, Morocco, Brazil, India and Bolivia.



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