Tropical Products Institute

G167

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ERRATUM

Page 30, paragraph 1, line 2:

For 'page 27' read 'page 31'.

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Overseas Development Administration

This report was produced by the Tropical Products Institute, a British Government organisation that co-operates with developing countries in helping them to derive greater benefit from their plant and animal resources. It specialises in post-harvest problems and will be pleased to answer requests for information and advice addressed to the Director.

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Contents

FIGURES IN TEXT

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The information contained in this report is based primarily on the results of interviews conducted with members of the essential oils trade in the USA, the United Kingdom, France, the Federal Republic of Germany, the Netherlands and Switzerland. The author wishes to acknowledge with gratitude the assistance and advice given by all the individuals, companies and organisations contacted during the course of the study.

NOTE

The following apply in all tables:

- — nil or negligible (in occasional instances may be included with 'Other countries')
- ... not available

Apparent minor errors in the totals or 'Other countries' category are due to rounding.

In some cases volumes were expressed in litres in the original source. These have been been converted to tonnes to facilitate comparison with other tables.

Summaries

SUMMARY

Selected markets for the essential oils of patchouli and vetiver

The essential oils of patchouli and vetiver, although they differ markedly in their odour and chemical characteristics, share one very important common attribute, namely that they are among the most important naturally-occurring 'base' materials used in the perfumery industry. Although not often used as dominant sources of fragrance in their own right, they are very widely used to give a solid foundation and lasting character to a fragrance, whether it is to be used in a high-class perfume or in cheaper products such as toilet soaps, cosmetic lotions, deodorants and so forth. Both oils have distinctive odour characteristics, among which 'woody'-type notes predominate; neither has yet been, nor seems likely to be, reproduced accurately from synthetic aroma chemical formulations.

This report reviews recent market movements and their implications for the future of these oils and for the prospects for more widespread production. The basic conclusions are as follows:

1 The main producer of **patchouli oil** is Indonesia (Sumatra), only relatively very small quantities being produced elsewhere, for example in China, Malaysia, Taiwan and Brazil. Annual consumption throughout the world is estimated to fall within the following ranges:

USA	210–220 tonnes
United Kingdom	45–60 tonnes
France	40–50 tonnes
Federal Republic of Germany	35–40 tonnes
Netherlands	*c.*30 tonnes
Switzerland	40–50 tonnes
Japan	*c.*30 tonnes
India	50 tonnes
Other	*c.*25 tonnes

2 In spite of the fact that patchouli oil has hitherto been a virtually indispensable ingredient in perfumery, the oil's reputation has suffered as a result of periodic irregularities of supplies, undue variations in quality, excessive levels of adulteration with materials such as gurjun balsam oil, and price fluctuations. These problems recently induced one major user to reduce its annual consumption by 25–45 tonnes per annum, and, although cutbacks of this order have not so far been evident elsewhere, the medium-term trend in consumption is only level or at best very slightly upwards. Although the oil cannot economically be synthesised and therefore cannot be replaced in existing compounds, there is a tendency on the part of perfumers progressively to reduce the proportionate quantities used in new products, use instead being made of other 'woody'-type natural products and the few synthetic materials available which can convey a 'woody' effect at reasonable cost.

3 Existing producers are fully capable of meeting the likely future level of world demand and there are no signs as yet of supply falling behind demand over an extended period of time. The prospects for new producers are therefore rather poor, and indeed successful patchouli oil production is not easy to achieve on account of the fairly rigorous requirements of the market in terms of odour and chemical characteristics, and also of the fact that a considerable amount of land is required to allow for the necessary crop rotation, since the patchouli plant rapidly exhausts the soil.

4 **Vetiver oil** is produced mainly in Haiti, Indonesia (Java) and Réunion, smaller quantities coming from China, Brazil and occasionally elsewhere. By far the best oil is produced on Réunion Island but, in quantity terms, production is dominated by Haiti and Indonesia, the Haitian oil being distinctly better than Indonesian and not far behind the quality of the Réunion ('Bourbon') oil. Annual consumption throughout the world is estimated as follows, all figures or ranges being approximate:

USA	100 tonnes
United Kingdom	20–25 tonnes
France	50 tonnes
Federal Republic of Germany	6 tonnes
Netherlands	5 tonnes
Switzerland	30 tonnes
Japan	10 tonnes
Other	30–40 tonnes

5 Vetiver oil can be used direct, unprocessed, in perfume compounds, but it is a common practice to process the oil to produce derivatives such as vetiver acetate or vetiveryl acetate before use, as these compounds possess a softer odour than does the unprocessed oil.

6 The reputation of vetiver oil has suffered in recent years primarily as a result of market distortions brought about by the tightly controlled Haitian production and export system and the rather indifferent and variable quality of the Indonesian oil, while the 'Bourbon' oil has tended to lose favour primarily on account of its high price. Therefore, although a completely synthetic vetiver oil cannot be manufactured at a realistic price, users are tending to reduce their consumption of the oil in new products, substituting alternative materials of a 'woody' character such as cedarwood oil and its derivatives. For this reason, world consumption of vetiver oil is likely to remain at its present level rather than show any increase even in line with population growth, this being true in virtually all markets.

7 The prospects for new producers of vetiver oil are poor, the existing producers generally being more than capable of meeting the likely level of world demand which, as already noted, is not expected to increase appreciably from present levels. Production costs in Indonesia and Haiti, moreover, are probably as low as they could be anywhere, and a fall in production brought about by depressed price levels would in consequence offer no inducement for profitable production elsewhere.

RÉSUMÉ

Marchés choisis pour les essences de patchouli et de vétiver

Les essences de patchouli et de vétiver, bien qu'elles diffèrent nettement par leurs caractéristiques odorantes et chimiques, possèdent en commun un trait très important, à savoir le fait qu'elles sont parmi les substances naturelles "de base" les plus importantes utilisées dans l'industrie de la parfumerie. Bien qu'elles ne soient pas souvent utilisées telles qu'elles comme sources dominantes de fragrance, elles sont très largement utilisées pour donner une base solide et un caractère durable à une fragrance, qu'elle soit utilisée dans un parfum de grande classe ou dans des produits moins chers, tels que savons de toilette, lotions cosmétiques, déodorants, etc. Les deux essences ont des caractéristiques odorantes distinctives, parmi lesquelles les

notes de type odeur 'de bois' prédominent; aucune n'a encore été reproduite avec précision, et ne semble pas pouvoir l'être, à partir de formules chimiques d'aromes synthétiques.

Dans ce rapport, on passe en revue les récents mouvements du marché et leurs conséquences pour le futur de ces essences ainsi que pour les perspectives d'une production plus étendue. Les principales conclusions sont les suivantes:

1 Le principal producteur d'**essence de patchouli** est l'Indonésie (Sumatra), des quantités relativement très petites étant produites ailleurs, par exemple, en Chine, en Malaisie, à Taiwan et au Brésil. La consommation annuelle dans le monde est estimée comme suit:

Etats-Unis	210–220 tonnes
Grande-Bretagne	45–60 tonnes
France	40–50 tonnes
Allemagne de l'Ouest	35–40 tonnes
Pays-Bas	env. 30 tonnes
Suisse	40–50 tonnes
Japon	env. 30 tonnes
Inde	50 tonnes
Autres	env. 25 tonnes

2 Malgré le fait que l'essence de patchouli ait été jusqu'à présent un ingrédient pratiquement indispensable en parfumerie, la réputation de l'essence a souffert par suite d'irrégularités périodiques d'approvisionnement, des variations abusives de la qualité, des niveaux excessifs d'adultération avec des substances telles que l'essence de baume de gurjun et des fluctuations des prix. Ces problèmes ont récemment incité un utilisateur majeur à réduire sa consommation annuelle de 25–45 tonnes et, bien que des régressions de cet ordre n'aient pas été observées jusqu'à présent ailleurs, la tendance à moyen terme dans la consommation est seulement au même niveau ou au mieux très légèrement croissante. Bien que l'essence ne puisse pas être synthétisée de façon économique et par conséquent ne peut pas être remplacée dans les composés existants, il existe une tendance de la part des parfumeurs de réduire progressivement les quantités proportionnelles utilisées dans de nouveaux produits, en utilisant à la place d'autres produits naturels ayant une odeur de type "de bois" et les quelques substances synthétiques existantes qui peuvent donner un effet d'odeur "de bois" à un prix raisonnable.

3 Les producteurs existants sont pleinement en mesure de faire face au niveau futur probable de la demande mondiale et il n'y a pas de signes jusqu'à présent que l'approvisionnement tombe en-deçà de la demande pendant une certaine période. Les perspectives pour de nouveaux producteurs sont par conséquent assez mauvaises et, en fait, une production satisfaisante d'essence de patchouli n'est pas facile à atteindre, compte tenu des exigences assez rigoureuses du marché en ce qui concerne les caractéristiques odorantes et chimiques et également du fait qu'une quantité considérable de terre est nécessaire pour permettre la rotation indispensable des cultures étant donné que la plante de patchouli épuise rapidement le sol.

4 **L'essence de vétiver** est produite essentiellement à Haïti, en Indonésie (Java) et à la Réunion, de plus petites quantités provenant de Chine, du Brésil et parfois d'ailleurs. De loin la meilleure essence est produite à la Réunion, mais en ce qui concerne la quantité, Haïti et l'Indonésie prédominent, l'essence haïtienne étant nettement meilleure que l'indonésienne, et pas loin derrière la qualité de l'essence de la Réunion ('Bourbon'). La consommation annuelle dans le monde est estimée comme suit, les chiffres et les limites étant approximatifs:

Etats-Unis	100 tonnes
Grande-Bretagne	20–25 tonnes
France	50 tonnes
Allemagne de l'Ouest	6 tonnes
Pays-Bas	5 tonnes

Suisse	30 tonnes
Japon	10 tonnes
Autres	30—40 tonnes

5 L'essence de vétiver peut être utilisée directement, non transformée, dans les parfums, mais il est de pratique courante de traiter l'essence pour produire des dérivés, tels que l'acétate de vétiver ou l'acétate de vétivéryle avant utilisation, car ces composés possèdent une odeur plus douce que l'essence non transformée.

6 La réputation de l'essence de vétiver a souffert au cours des dernières années essentiellement à cause des fléchissements du marché provoqués par le système de production et d'exportation haïtien étroitement contrôlé et la qualité plutôt indifférente et variable de l'essence indonésienne, alors que l'essence 'Bourbon' avait tendance à perdre la faveur principalement à cause de son prix élevé. C'est pourquoi, bien qu'une essence de vétiver complètement synthétique ne puisse pas être fabriquée à un prix raisonnable, les utilisateurs ont tendance à réduire leur consommation en essence dans leurs nouveaux produits, la remplaçant par d'autres substances ayant une odeur de type 'de bois', par exemple par l'essence de bois de cèdre et ses dérivés. Pour cette raison, la consommation mondiale d'essence de vétiver restera probablement à son niveau actuel sans présenter d'augmentation, même en parallèle avec l'accroissement de la population, cela étant vrai pratiquement pour tous les marchés.

7 Les perspectives pour de nouveaux producteurs d'essence de vétiver sont mauvaises, les producteurs existants étant en général plus qu'en mesure de faire face au niveau probable de la demande mondiale pour laquelle, comme on l'a déjà dit, on ne prévoit pas d'augmentation appréciable. En outre, les prix de production en Indonésie et à Haïti sont probablement aussi bas qu'ils pourraient l'être ailleurs et une chute de production provoquée par des prix effondrés n'offrirait en conséquence aucun motif pour une production profitable ailleurs.

RESUMEN

Mercados seleccionados para los aceites esenciales de pachulí y vetiver

Los aceites esenciales de pachulí y vetiver difieren marcadamente en lo que respecta a sus características químicas y olorosas, pero comparten un rasgo común transcendental, ya que son entre las materias naturales 'básicas' más importantes usadas en la industria de la perfumería. Si bien no se usan frecuentemente por sí solas como fuentes principales de fragancia, se emplean muy extensamente para dar un fundamento sólido y un carácter duradero a una fragancia que vaya a incorporarse ya sea en perfumes de primera clase, o bien en productos más económicos tales como jabones de tocador, lociones cosméticas, desodorantes, etc. Ambos aceites tienen olores característicos entre los cuales destacan los que despiden aromas de tipo 'leñoso'. Ninguno de ellos ha sido hasta la fecha reproducido de manera exacta (siendo poco probable al parecer que lo sea en el futuro) por medio de formulaciones químicas de aromas sintéticos.

En este informe se hace una reseña de los movimientos recientes del mercado y de sus consecuencias para el futuro de estos aceites, así como para las perspectivas de una producción más difundida. Se formularon las conclusiones básicas siguientes:

1 El principal país productor de **aceite de pachulí** es Indonesia (Sumatra), siendo solamente producidas cantidades relativamente pequeñas en países tales como China, Malasia, Taiwan y Brasil. El consumo anual en todo el mundo se calcula dentro de las cifras siguientes:

Estados Unidos	210—220 toneladas
Reino Unido	45—60 toneladas
Francia	40—50 toneladas
Alemania Occidental	35—40 toneladas

Países Bajos	c. 30 toneladas
Suiza	40–50 toneladas
Japón	c. 30 toneladas
India	50 toneladas
Otros países	c. 25 toneladas

2 A pesar del hecho de que el aceite de pachulí ha sido hasta la fecha un ingrediente prácticamente indispensable en la perfumería, la reputación del aceite se ha visto perjudicada debido a irregularidades periódicas en las entregas, variaciones indebidas en la calidad, niveles excesivos de adulteración con materias tales como aceite balsámico de gurjun, y a las fluctuaciones de precios. Estos problemas obligaron hace poco a un importante usuario a reducir su consumo anual en una cantidad equivalente a 25–45 toneladas por año y, si bien reducciones de esta índole no se han manifestado hasta ahora en otras partes, la tendencia a plazo medio en el consumo se halla solamente nivelada o, en el mejor de los casos, mostrando un aumento sumamente ligero. Aunque el aceite no puede sintetizarse económicamente y por consiguiente no puede ser sustituido en los compuestos existentes, existe la tendencia por parte de las perfumerías a reducir gradualmente las cantidades proporcionales usadas en los nuevos productos, para emplear en cambio otros productos naturales de tipo 'leñoso' y los pocos materiales sintéticos disponibles que pueden producir un aroma de tipo 'leñoso' a un precio razonable.

3 Los productores existentes son totalmente capaces de satisfacer el nivel futuro de la demanda mundial y no hay señales aún de que el suministro sea inferior a la demanda a lo largo de un período prolongado de tiempo. Las perspectivas para los nuevos productores son así pues bastante malas; además, no es fácil obtener con éxito una producción adecuada de aceite de pachulí debido a los requerimientos bastante exigentes del mercado, en lo referente a sus características químicas y olorosas, y al hecho de que es preciso disponer de una cantidad considerable de terrenos para permitir la alternación de cultivos de cosechas necesaria, ya que la planta de pachulí agota con rapidez la fertilidad de la tierra.

4 El **aceite de vetiver** se produce principalmente en Haití, Indonesia (Java) y en la Reunión, con cantidades más pequeñas provenientes de China, Brasil y de vez en cuando de otros países. Con mucho, el mejor aceite se produce en la Isla de Reunión, pero en lo que refiere a las cantidades del mismo, la producción mayor se efectúa en Haití y en Indonesia, siendo la calidad del aceite haitiano definitivamente mejor que la del indonesio y no mucho menos inferior que la del aceite de la Reunión ('Bourbon'). El consumo anual en todo el mundo se calcula como sigue, siendo todas las cifras o escalas aproximadas:

Estados Unidos	100 toneladas
Reino Unido	20–25 toneladas
Francia	50 toneladas
Alemania Occidental	6 toneladas
Países Bajos	5 toneladas
Suiza	30 toneladas
Japón	10 toneladas
Otros países	30–40 toneladas

5 El aceite de vetiver puede usarse directamente, sin elaborar, en compuestos de perfumes, pero la costumbre normal es elaborar el aceite para producir derivados tales como acetato de vetiver o acetato vetiverílico antes de ser empleado ya que estos compuestos poseen un olor más suave que el del aceite sin elaborar.

6 La reputación del aceite de vetiver se ha deteriorado recientemente principalmente a consecuencia de las deformaciones del mercado creadas por el estrechamente controlado sistema de producción y exportación haitiano, y la calidad algo mediocre y variable del aceite indonesio, mientras que el aceite 'Bourbon' ha tendido a perder la preferencia debido primordialmente a su costo elevado. Así pues, si bien no puede producirse un aceite de vetiver totalmente sintético a un precio realista, los usuarios del mismo tienden en la actualidad a reducir su consumo en los nuevos

productos, sustituyendo materiales alternativos de tipo 'leñoso' tales como el aceite de madera de cedro y sus derivados. Por esta razón, es probable que el consumo mundial de aceite de vetiver permanezca en su nivel actual en lugar de mostrar incremento alguno aún en relación con el crecimiento de la población, siendo esto así en prácticamente todos los mercados.

7 Las perspectivas para los nuevos productores de aceite de vetiver son malas, siendo los productores existentes generalmente más que capaces de satisfacer el probable nivel de la demanda mundial el cual, como ya se ha dicho, no se espera que aumente notablemente en relación con los niveles actuales. Además, los costos de producción en Haití e Indonesia son probablemente más bajos que los que pudieran ofrecerse en cualquier otra parte y un descenso en la producción creado por unos niveles de precios muy bajos no ofrecería por consiguiente aliciente alguno para una producción rentable en otras partes del mundo.

Section 1

Patchouli oil

1.1 DESCRIPTION, USES AND PRINCIPAL SOURCES

Although there are several tropical plants possessing a patchouli-like odour, the plant from which the patchouli oil of commerce is obtained is *Pogostemon cablin* Benth., also known as *Pogostemon patchouli* Pellet. The plant grows wild in several parts of the world, but it is usual to cultivate it for distillation purposes rather than harvest the wild plant.

The patchouli fragrance has been known in the Orient for centuries. At one time it was usual to impart the fragrance by means of the dried leaves, and this is still true in one or two producing areas for certain applications, but outside the producing countries the steam-distilled essential oil is the universal medium. The exact character and quality of the oil depends on several factors, including the cultivar grown, the cultivation and harvesting regime, drying and storage practices for leaf and stalk prior to distillation, the distillation technique, and subsequent handling and storage of the product. It is also the case that aged oils tend to have a finer and fuller fragrance than freshly-distilled oils.

Patchouli oil has traditionally been one of the most important natural raw materials used in perfumery, and this is still true to a large extent today. It has notably strong fixative properties, that is it helps to prevent excessively rapid evaporation of a perfume and thereby promotes tenacity, and although this is not necessarily the primary reason for its use it is often an important consideration. The basic character of the fragrance, apart from its tenacity, is its dominant woody-type note, although the aroma possesses other characteristics and is very complex. In a typical oil the sweet character of the fragrance should persist throughout all stages of evaporation. However, there are very definite differences between patchouli oils from various sources, and user requirements also vary. Generally speaking the olfactive value of the oil — that is the strength of the fragrance for a given volume of the oil — is of major importance, and for this reason the proportion of the oil's constituents attributable to the alcohols, which are the main contributors to the oil's special character, is a primary consideration. The main alcohol *patchoulol* may account for between 23% and 55% of the oil, averaging about 33% by volume, while among the minor alcohols, between 0.4% and 0.6% of the oil is usually attributable to *norpatchoulenol*. However, in spite of modern scientific and olfactive techniques of analysis, it is still not known precisely which components, or combination of components, are primarily responsible for patchouli oil's unique character, and it is primarily for this reason the oil has so far defied all attempts at accurate synthesis, although it is also widely believed that, even if the components could be accurately identified beyond all reasonable doubt, they would be very expensive to synthesise.

Patchouli oil is generally, although not exclusively, used in products at the upper end of the market, where its 'woody' character is constantly popular. It is generally blended with other essential oils, for example those of geranium or clove, before use, although cosmetic products do exist which embody patchouli oil as the dominant fragrance. It is used in a very wide range of toilet soaps, scents for women, body

lotions for men, pre-shave and after-shave lotions, and in one or two household products, including detergents. Its strong tenacity, however, renders it particularly suitable for heavy perfumes and for the imparting of a lasting character and strength to lighter perfumes. However, periodic problems of erratic supply, excessive price variations, and quality problems in terms of poor colour, adulteration practices and undue variation in odour or chemical composition, have tended to militate against any strong growth in consumption, and the oil nowadays enjoys less prominence in new perfume creations than it once did. The fact that it is a basic 'building block' in a whole range of perfumes rather than a particularly fashion-sensitive oil did not, for example, deter one major manufacturer of soap products recently from virtually dropping patchouli oil altogether in a new range of products in its European operations, thereby reducing the world market by between 25 and 45 tonnes per annum, that is between 5% and 9% at a stroke. The oil's position is therefore not impregnable.

Unlike some other essential oils, patchouli oil is used mainly *per se,* that is as an oil in its entirety, rather than as a source of any of its individual components. It is occasionally refined in order to improve its fragrance, but it is virtually never subjected to deterpenation. The oil also improves with ageing and consequently some users are inclined to hold somewhat larger stocks of the oil than they would otherwise.

The principal and traditional source of patchouli oil is Indonesia, which accounts for rather more than 80% of annual world production. The bulk of the remainder is attributable to China. The other known producers, principally Taiwan, Brazil and one or two Caribbean islands, at present account for only a very small, virtually negligible, proportion of total production. The Seychelles was an important producer at one time but is no longer, while production elsewhere has mostly, although not exclusively, been undertaken on an experimental basis, and it has seldom led to successful commercial production. Total world production of patchouli oil is in the order of 500—550 tonnes per annum, possibly rather nearer the lower limit of this range. The following section contains a detailed analysis of production and exports.

1.2 PRODUCTION AND EXPORTS

1.2.1 Indonesia

The Indonesian island of Sumatra has long been recognised as the world's principal source of patchouli oil. Annual production there has varied considerably from year to year, mainly as a consequence of substantial price fluctuations, although there have undoubtedly been other influences also. Production statistics are not often published, but there is a broad consensus to the effect that Indonesian production in recent years has averaged around 450 tonnes per annum, a figure which is supported by the export figures given in Appendix 1, Table 1, virtually all local production being exported. Production of leaf mainly takes place on smallholdings and the oil is mainly distilled in villages by farmers who hire local stills for one or two days. The oil is sold to village merchants or itinerant collectors and taken to the main exporters, who are mostly located in the port of Medan. The producers continue to be fairly numerous but the number of exporters seems to have steadily contracted over the years.

For a long time the bulk of production was located in the Sidikalang Highlands, with a lower level of production in the northern district of Atjeh, but somewhat rapid exhaustion of the soil, which is one of the plant's characteristics, and rather limited facilities for crop rotation, as well as problems of nematode attack, have caused a shift in the location of production and in more recent years production has predominantly taken place on the offshore island of Nias. However, soil exhaustion problems have begun to overtake the Nias producers and there has been a resurgence of production on the mainland. Currently it is estimated that two-thirds of national pro-

dction takes place on Nias, about 10% in the Sidikalang Highlands and the balance in the Atjeh area.

An appreciable proportion of Indonesian exports – estimated at between one-quarter and one-third – of patchouli oil reach their ultimate destinations through nearby Singapore, which has long been an important entrepôt for patchouli oil as well as many other commodities produced in the South East Asian region. Additional, smaller though still significant, quantities of patchouli oil are transhipped at the Malaysian port of Penang. This is discussed more fully in subsequent sections, but for the present it should be observed that one or two Western buyers still prefer to obtain their supplies of patchouli oil from Singapore, rather than direct from the Indonesian port of Medan*, although their number is in steady decline.

Part of the reason for the flourishing trade through Singapore is that shipping and financial advantages can often be enjoyed by buyers who conduct their trade through this channel. In addition, although the established exporters in Medan are well regarded, there have been a number of other exporters whose questionable trading practices have tended to tarnish the reputation of the Indonesian essential oils trade generally. Furthermore, there has been a longstanding and very widespread tendency for Indonesian patchouli oil to be adulterated with the oil distilled from gurjun balsam and with gurjun balsam itself, generally the former; this material is readily available in the patchouli-producing areas of Indonesia. Adulteration is normally carried out by 'middlemen' in the intermediate section of the marketing chain. It is unusual for farmers or distillers to sell adulterated patchouli oil, but it is nonetheless not unknown. This practice used to take place to a greater extent on a rising market, when quick profits were to be made, than on a falling market, but in recent times it has become fairly general regardless of market conditions. Buyers have gradually come to accept the presence of small quantities of gurjun balsam in patchouli oil provided it is held within strict limits; for some the limit is 1%, others being prepared to tolerate 3–4% or even 5%†. One buyer has pointed out that patchouli oil from the Sidikalang Highlands in particular can withstand a relatively high level of adulteration with gurjun balsam as the basic odour of the oil produced in that region is so strong. One or two other buyers have maintained that the olfactive value of patchouli oil is increased through the addition of small quantities of gurjun balsam oil and in fact it has been said in some quarters that, so accustomed have some perfumers become to the presence of gurjun balsam oil in patchouli oil, that they might well reject pure, unadulterated patchouli oil as atypical. While this might be true to a small extent, the practice continues to cause constant anxiety, especially as there have been several instances of the proportion of gurjun balsam oil in consignments of patchouli oil rising over the 10% mark and even, in exceptional cases, running to 30–50% or even more. Very recently, however, there have been reports from Indonesia that the price of gurjun balsam oil has been rising in relation to that of patchouli oil, to the extent that it may soon become uneconomic to adulterate patchouli oil in this way. At the same time, though, there have also been disturbing reports of the adoption of new adulterants, such as palm oil and other vegetable oils, and, if true, the implications for the patchouli oil trade can only be very unfavourable. From time to time, moreover, users have experienced other problems, such as an excessively dark colour or the presence of undue levels of foreign matter in the oil as a result of inadequate filtration. Very many of the Singapore traders have facilities for monitoring the quality of consignments and, where necessary, for cleaning, grading and bulking of the oil, and this accounts in part for the continuing, if declining, demand for their services.

Despite the problems associated with Indonesian patchouli oil, the basic character of the oil remains a standard by which other patchouli oils are judged, particularly as

*Care should be taken when interpreting the export statistics for Indonesia, Singapore and Malaysia, on account of a possible risk of double-counting. For example, a consignment of oil shipped from Indonesia via Singapore to a given destination could conceivably appear in the export statistics of both Indonesia and Singapore against the name of that destination

†Detection of low levels of gurjun balsam oil adulteration in patchouli oil is difficult. The effective detection limit using conventional gas chromatography techniques is at best 1%

the patchoulol content is usually relatively high, at between 29% and 33%. It is in any case understood that the Department of Trade in Indonesia is aware of the concern expressed by buyers regarding quality problems, and new systems of inspection and quality control are being established, which it is hoped will obviate gross adulteration and other major quality defects in future export consignments.

1.2.2 China

Although it is not clear how long patchouli oil has been produced in China, there is no doubt that in recent years China has become a regular supplier to the world market, even though the quantities involved do not compare with those produced in Indonesia. Little published information of a general or statistical nature exists, but such evidence as is available, which consists mainly of the opinions of traders and users, suggests that the average level of production is currently between 50 and 80 tonnes annually, of which 25–30 tonnes reaches Western markets direct, a further 20 tonnes or so being destined for Malaysia and Singapore, where some is believed to be blended with Indonesian oil for resale (the very high level of imports from China into the USA during 1980 (49 tonnes) was almost certainly exceptional). The remainder of local production is consumed within the national boundaries. The current production trend is unclear.

Production takes place both on the mainland and on the offshore island of Hainan. Patchouli is mainly grown on the plains, in contrast with the mountainous producing areas of Indonesia. It tends to contain higher levels of acid and esters, and lower levels of alcohols (typically 23–25% patchoulol), than does the Indonesian oil, as well as possessing a less sweet character generally. Because of these differences between the Chinese and Indonesian oils, the Chinese oil has only limited application in the consuming countries. Although more consistent in quality than the Indonesian oil, its character is too different for it to be widely acceptable for use *per se,* and it is commonly blended before use with Indonesian oil. It is the opinion of most buyers that, if the Chinese oil is to sell successfully, its price needs to be appreciably lower than that of the Indonesian oil. For much of the last few years this has in fact been the case, but in 1980 the price rose in response to a sharp rise in Indonesian prices, and then failed to fall back sufficiently fast when the Indonesian price subsequently fell. In consequence, the Chinese oil was for a time considered uncompetitive.

Chinese oil is usually sold on specification, unlike the Indonesian oil which is normally traded on a sample basis. Three grades are offered on the basis of solubility in ethanol, namely 1: 7–9, 1: 11–12 and 1: 13–14. Of these grades, the 1: 11–12 is the most popular.

Nowadays it is increasingly possible to negotiate with provincial rather than central Chinese marketing organisations, and some buyers have commented that this is increasing the competitive effectiveness of the Chinese patchouli oil trade, although the Chinese insistence on selling on the basis of specification rather than sample seems to be a deterrent to some otherwise willing buyers.

1.2.3 Singapore and Malaysia

Although very little patchouli oil is actually distilled in Singapore and Malaysia, this is an appropriate point at which to draw attention to the importance of these two countries in the patchouli oil trade. For many commodities, the importance of Singapore as an entrepôt is declining, but in the case of patchouli oil there seems to have been something of an increase in activity during the past 10 years, the quantities exported and re-exported increasing from an annual average of 142 tonnes during the 5–year period 1970–74 to 163 tonnes during the following period 1975–79, although a decline is expected for the future. It is sometimes the case that the documentation relating to certain consignments of patchouli oil are handled by Singaporean traders even though the consignments themselves are ultimately shipped direct to the customer from the Indonesian port of Medan. For example, at least one buyer opens Letters of Credit through Singapore although the consignments

reach him direct from the port of origin. Reference has already been made to the reasons for the traditional popularity of Singapore on the part of buyers. They include efficiency and rapidity of processing of documentation and subsequent shipment, more rapid transit time, better quality surveillance, facilities for any necessary cleaning, grading and bulking and a higher standard of reliability generally. The reason for the aforementioned anticipated decline in Singapore's importance in the patchouli oil trade, however, is that an increasing number of compounders nowadays prefer to undertake any needed cleaning, filtering and bulking themselves.

Reference should be made to Appendix 1, Table 2, for a breakdown of Singapore's export and re-export trade in patchouli oil. Many of the major importing countries rely to some extent on Singapore for their supplies. Corresponding statistics for Malaysia are shown in Appendix 1, Table 3, but figures were not available at the time of writing* for the year 1978 and thereafter. However, although there is no universal agreement on the matter among traders, it seems clear that part of the combined outflow of patchouli oil from Singapore and Malaysia consists not of true re-exports in the accepted sense of the term, but of exports of reprocessed, refined and blended oil, and, in the case of Malaysia, of locally distilled oil. Distillation of patchouli oil in Malaysia from local leaf is certainly only a very small operation on account of high local labour costs, annual production of so-called 'Penang patchouli oil' being no more than 3–5 tonnes. Traders in both Singapore and Malaysia, however, undertake the cleaning and refining of sub-standard Indonesian oil, and the evidence also suggests that one or two operators in both countries sometimes blend small quantities of Chinese oil into consignments of Indonesian oil, as a means of disposing of Chinese oil which would otherwise be unsaleable on account of the limited demand for it. This practice is known to several buyers, a number of whom accept it and find the hybrid oil acceptable. It is also evident that at any rate in Singapore, there is a small amount of distillation of oil from imported Indonesian patchouli leaf, an average of 110 tonnes per annum of leaf, equivalent to between 4 and 5.5 tonnes of distilled oil, having been shipped from Indonesia to Singapore during the period 1975–79.

There are thus several types of patchouli oil issuing from Singapore and Penang. Although it would appear that it is not always easy or possible to identify the precise origin or nature of a given consignment of oil purchased from these ports, the reputation of most of the exporters for dependability is such as to offset any uncertainty arising from the extent of local reprocessing and blending operations.

At the time of writing*, the Indonesians had more patchouli oil in stock than they could sell, and in an effort to dispose of their surplus stocks were selling more oil through Singapore and Malaysia than has been usual in the past.

1.2.4 Taiwan

Despite the lack of a clear consensus on the part of traders, it is concluded that some patchouli distillation takes place in Taiwan, in addition to periodic re-exports of Indonesian oil from the island. The magnitude of local production is unknown, but it is certainly small. It seems to be geared more to the Japanese and European markets than to the North American market, although the existence of the oil is known to some New York buyers, one of whom indicated that the quality of Taiwan oil is very good, although different from that of Indonesian oil. The character difference is in part attributable to the use of modern equipment. At the time of writing* some expansion of Taiwan's patchouli oil operations was anticipated, particularly in European quarters, but there can be little doubt that the high cost of Taiwan labour, together with Taiwan's remoteness from the main markets (Japan excepted) and the consequent incidence of high shipping costs in the export trade, militates against successful long-term Taiwan participation in the patchouli oil trade, except at times of high prices. At current price levels, Taiwan production and trade would certainly be uneconomic.

*December 1981–January 1982

1.2.5 Brazil

Several attempts have been made to produce patchouli oil on a commercial basis in Brazil, but the only operation which has stood the test of time is one being undertaken by a Japanese firm near the port of Salvador in Bahia State. Other operations have either fallen victim to various production problems, including drought, or else were of a purely experimental nature. The current level of production appears to be between 1 and 3 tonnes annually and aimed primarily at the internal market rather than the export trade, which is perhaps to be expected in the light of both Brazil's growing domestic market and the local wide-ranging restrictions on the imports of certain products. Exports have been recorded, however, although on an intermittent basis. While some overseas buyers are watching developments there with interest, particularly as the oil appears to be of good quality, light colour, and closer in character to the Indonesian oil than to the Chinese, the current scale of operation is too small to be of much commercial interest overseas.

1.2.6. Other and former sources

India. Patchouli oil is distilled in India, but generally for internal use rather than for export. In any case the character of the local oil renders it unsuitable for use in most applications in the main consuming countries, although certain oils from the north of the country have been reported as being rather closer to the Indonesian oil in character. India is a net importer of patchouli oil and is unlikely to participate in the export trade in the foreseeable future.

West Indies. There is evidence that patchouli oil has been produced in one or two Caribbean islands, although in most cases, for example Dominica and, probably, the Dominican Republic, production has been on an experimental basis only. A very small commercial operation is said to have existed on St Vincent, but appears no longer to be in production. Another minor operation may exist in Martinique, but this has not been confirmed. However, not withstanding such operations and the various plans that have existed — and still exist in the case of Dominica — for producing the oil in the region on a commercial basis, there is as yet little or no prospect of production on any appreciable scale.

France. There used to be regular and substantial imports of patchouli leaf into France from the Seychelles and Indonesia for the distillation of a high-quality oil in the perfumery centre of Grasse. This trade has now dwindled to minimal proportions. Redistillation of imported patchouli oils continues to take place in France, however, and there is also a substantial French re-export trade in patchouli oil as will be further discussed in the section on imports.

Seychelles. At one time the Seychelles was the second most important exporter of patchouli oil after Indonesia, but since the early 1970s production and exports have declined to zero, primarily as a result of the development of the tourist industry there, and a consequent dwindling of the labour force in the agro-industrial sector. No commercial-scale production existed at the time of writing.*

Guatemala. An attempt was made to produce commercial quantities of patchouli oil in Guatemala during the 1960s and early 1970s, but, although it would appear that an oil of fair quality was produced, the project eventually failed because, firstly, the patchouli plant failed to stand up to local conditions and, secondly, crop rotation was not undertaken sufficiently frequently to combat the problem of soil exhaustion. There appear to be no plans for renewed production.

Mexico. Both the USA's trade statistics and the opinions of the essential oils trade suggested that Mexico was once a producer and exporter of patchouli oil, but not recently and only over a short period of time. It is considered to be extremely unlikely that production will take place there in the future.

*December 1981—January 1982

Other sources. The trade statistics suggest that Madagascar has been an occasional producer and exporter of patchouli oil and that production has occasionally also taken place in Reunion. In both cases, however, production was probably geared mainly to the needs of French buyers. No other producers of the oil are known.

1.2.7. Trade in patchouli leaf

Although, as mentioned previously, there continues to be some trade in patchouli leaf between Indonesia and Singapore for the purpose of local distillation operations in Singapore, there is little evidence of any evidence of any appreciable trade in the leaf elsewhere, at any rate recently. France imports only very small quantities currently, although there were more appreciable imports during the mid-1970s. Patchouli leaf is a bulky material and the cost of transporting it is nowadays very high.

1.3. MARKETS AND PROSPECTS

1.3.1 The USA

Reference should be made to Appendix 1, Table 4 where a breakdown of the official trade statistics of imports of patchouli oil into the USA is given. Conversion of the total annual import figures to give a 5-year moving average indicates that there has been no strong upward or downward trend, and that the market in recent years has been around 210–220 tonnes per annum on average. Although the actual import figures for the three most recent years, 1978–80, suggest that at any rate a short-term upward trend may have set in, most US dealers or users considered that there is no long-term upward trend, and that consumption is more or less stable.

It will be evident from Appendix 1, Table 4 that during most recent years over 90% of the USA's supplies were imported direct from Indonesia. In 1980, however, the proportion of imports of Indonesian origin dropped to just over the 80% level, the balance being attributable mainly to direct imports from China which in previous years had made an almost negligible contribution to US imports. The 1980 peak, however, may have been due to acute shortages of Indonesian oil which occurred during the early part of that year. The very small residual balance of supplies is attributable mainly to European re-exports, and it is very possible that some of these re-exports may have been of Chinese origin.

US re-exports of patchouli oil are of relatively minor and decreasing importance.

The larger US companies nowadays tend to obtain their supplies direct from the source countries, and this type of purchase accounts for over 50% of imports, but smaller users still make use of the New York network of dealers, agents and brokers. It would appear that relatively few US buyers make use of Singapore nowadays. Although the statistics for US imports from Singapore do not correspond accurately with those for exports from Singapore to the USA (*see* Appendix 1, Table 2), it is plain that trade via Singapore has declined in recent years.

Most US users seem to prefer **Indonesian oil,** with its high levels of patchoulol, to oil from other sources, in spite of its shortcomings in terms of inconsistent quality and variation in the levels of adulteration with gurjun balsam. Many processing houses stated that 1% was the maximum tolerable level of gurjun balsam, although one or two dealers remarked that it was often possible to sell patchouli oil with a slightly higher level of adulteration. However, gurjun balsam levels of higher than 5% were reported as having been rather frequent, and this was usually unacceptable. The main attraction of **Chinese oil** was said to be the fact that it is generally relatively cheap, but although it can be, and quite often is, blended with Indonesian oil, its characteristics are generally speaking too different from those of Indonesian oil for it to be widely used in the USA, at any rate *per se,* and there has yet to be any strong trend in favour of higher levels of usage of this oil there. The relatively high price of Chinese oil in 1980–81 further militated against its use, one prominent dealer maintaining that Chinese oil needs to be priced at a level at least US $6 per kilogram

below that of the Indonesian oil if it is to sell successfully. The existence of **Brazilian** and **Taiwan** oils was appreciated in the USA but there was little interest in oils from these sources. **Mexican** and **Guatemalan** oils had also been tried in the past, but either were too different from Indonesian oil to be acceptable or else ceased to be available.

The consensus view of the prospects for patchouli oil consumption in the USA is that, although the oil may well hold its own at existing consumption levels, there is unlikely to be any appreciable increase in consumption and one major dealer even forecast a slow decline. No accurate synthetic substitute exists, and although a synthetic patchoulol has been produced, its price of over US $100 per kilogram and certain shortcomings in its olfactive properties militates strongly against its adoption. However, the price and supply history of patchouli oil has not been an ideal one from the users' point of view, and the major soap manufacturing companies, who are particularly price-conscious in relation to perfume compounds nowadays, have been steadily working on methods of reducing their need for the special characteristics of patchouli oil, while in many new products the oil is being used in markedly lower relative quantities, as increasingly subtle and sophisticated methods of 'stretching' or modifying the basic oil are developed. Other natural essential oils such as those of cedarwood and guaiacwood are among the various products currently being used to reduce the need for patchouli oil.

There is no doubt that the very high price of patchouli oil in early 1980, which at one point reached over US $48 per kilogram in New York for the Indonesian oil, proved totally unacceptable to the US users, but at the current moderate price levels, providing also that the quality variations can be further reduced, the future of the oil in the US market can be reasonably assured.

1.3.2. The United Kingdom

Patchouli oil imports are not categorised separately in tlhe trade statistics of the United Kingdom, but all the available published information and trade opinions suggest that in recent years annual consumption in the United Kingdom has been in the range 45–60 tonnes. In addition there is an appreciable re-export trade as several United Kingdom dealers resell patchouli oil to the European continent and elsewhere.

As in other countries, most of the patchouli oil used in the United Kingdom is of **Indonesian** origin, although Appendix 1, Tables 1–3 suggests that a greater proportion of United Kingdom imports are obtained from or via Singapore than in the case of, say, the USA, this probably being due to the relatively close historical, political and economic ties between the United Kingdom and Singapore. **Chinese** oil is used in the United Kingdom but only in very small quantities and very seldom indeed in its own right, it usually being regarded as an extender for Indonesian oil. Its odour is regarded as less good than that of Indonesian oil and, although it is free of the problems of excessive foreign matter and adulteration with gurjun balsam that are experienced with Indonesian oil, comments were made about the oil's sometimes high iron content and dark colour, as well as the rather irregular pattern of supplies. As in the USA, it is usually only bought when it is appreciably cheaper than Indonesian oil. Patchouli oils from other sources are hardly ever used in the United Kingdom, although it is possible that small consignments of Malaysian oil may occasionally enter, and one dealer reported having seen small quantities of Brazilian oil. The consumption of patchouli oil in the United Kingdom is widespread, but two major processing and compounding firms appear to dominate consumption. Some direct purchases from source are made by the larger processing companies but the dealer-broker network continues to be widely used.

The pattern of usage in the United Kingdom is broadly similar to that applicable elsewhere, and there are no special local uses. Very many fine fragrances continue to depend to a considerable extent on patchouli oil as a base material, but United Kingdom consumption has been affected by the decision of a major soap manufacturing company to reduce very drastically its usage of patchouli oil in its European operations, as was mentioned in Section 1.1. While this is probably an isolated

incident, it is a warning of what could happen again if the severe quality problems and price fluctuations of the last few years recur. The quality of patchouli oil in general, especially the Indonesian, was said to have improved in recent months, but perfumers are increasingly reluctant to use the oil in new major lines of product in case the supply situation becomes difficult again in future years. As in the USA, true substitutes do not exist but certain types of extender do exist and, once these become established in formulations, they are difficult to dislodge. Leaving aside the recent dramatic fall in usage by the major soap manufacturing firm mentioned, consumption in the United Kingdom is expected to show a small annual increase, providing the fluctuations in price and quality do not become excessive. The outlook is therefore moderately promising.

1.3.3 France

Patchouli oil is not separately listed in the French trade statistics and it is not therefore possible to give an accurate indication of annual consumption in France, but such information as has been published and was provided by French users, suggests that it is of the order of 40–50 tonnes per annum, and more or less stable. However, probably as many tonnes again enter France for subsequent re-export to destinations in North America and elsewhere in Europe, including Eastern Europe. The greater part of these re-exports of patchouli oil are not reprocessed, but refining operations are undertaken in France, notably at Grasse, and there is a regular export trade in these higher, refined qualities of patchouli oil although the precise quantities involved are unknown.

Some major French processing and perfumery houses import patchouli oil direct from source, but most avail themselves of the dealers and brokers located mainly in Paris, Marseille and Bordeaux, who continue to conduct substantial business.

French users of patchouli oil tend to favour the **Indonesian** oil although there is constant anxiety about the fluctuating quality level experienced with this oil. It is generally recognised that, in order to minimise the risk of serious adulteration, it is necessary to enter into direct agreements with individual Indonesian producers, but most French firms do not have the resources for this type of arrangement and many buy from Singapore, as the oil obtained therefrom is said to be of appreciably better quality than that obtained direct from the Indonesian port of Medan. As will be seen from Appendix 1, Table 1, annual imports into France from Singapore have averaged around 40 tonnes in recent years. Some French users take the view that Indonesian oil is difficult to replace when the objective is to produce a refined oil of very high quality, but that it can be replaced in some ordinary perfumery applications. Certainly the local opinion of **Chinese** oil was fairly favourable, although one or two users mentioned exessive acid levels. Chinese oil appears to be used in fairly small but steady quantities in France, although its characteristics preclude its being substituted for Indonesian oil on a one-to-one basis. Mostly it is used for blending but occasionally it is used in its own right where precision of note is not a primary consideration. In recent years little oil, if any, has been imported from other sources; the existence of the **Brazilian** oil is known but imports have been insignificant.

Consumption of patchouli oil in France is not rising appreciably, but it is still regarded as an important basic 'building block' in perfumery and new fashions often dictate its use, for example in perfumes with an Oriental note. The reduction in utilisation of patchouli oil by the major soap manufacturer previously mentioned does not seem to have affected consumption appreciably in France. The broad pattern of consumption is similar to that in most other countries. Synthetic subsititutes of patchouli oil are virtually unkown in France, and extenders perhaps less used than in the USA or the United Kingdom. Although no great increase in consumption is to be expected, a steady future for patchouli oil in France seems assured.

1.3.4 The Federal Republic of Germany

Imports of patchouli oil into the Federal Republic of Germany (hereafter referred to as West Germany) are not given separately in the trade returns and only a rough estimate of national consumption is possible. On the available evidence it would seem

that rather less of this oil is used in West Germany than in the United Kingdom or France, annual consumption appearing to be of the order of 35–40 tonnes. Most of the oil enters West Germany by the ports of Hamburg and Bremen, where the main dealers and brokers are located, but the larger processing companies tend to import their requirements direct from the countries of origin. Additional quantities of patchouli oil are imported for subsequent re-export to other destinations, particularly in Eastern Europe.

As in other countries, the **Indonesian** oil is preferred, and although high levels of adulteration are unacceptable, low levels of up to 3% are generally regarded as acceptable, provided the oil is up to standard in other essential respects. It was said that some West German perfumers would probably reject an oil completely free of gurjun balsam as atypical. Indonesian oil is normally imported into West Germany direct from Medan in Indonesia, relatively small quantities being obtained from Singapore, although the documentation often passes through this channel even for direct shipments from Medan. Trade with Indonesia is almost always conducted on a sample basis and the system is said to work well. **Chinese** oil is also used, but as elsewhere the differences between it and Indonesian oil preclude its widespread use except to a limited extent as an extender. It is in no way regarded as a direct substitute for Indonesian oil. Furthermore, its recent relatively high price temporarily removed its competitive advantage over the Indonesian oil, and unless this advantage is maintained the Chinese oil is unlikely to be used at all unless Indonesian oil becomes very short. Oils from other sources are virtually unknown in West Germany, and the Indonesian oil seems likely to maintain its dominant position, especially as a majority of German users require a patchoulol content in excess of 30%, while one dealer stressed the importance of as high as possible a level of the alcohol norpatchoulenol.

As applies elsewhere, patchouli oil is used in West Germany mainly in up-market soaps, cosmetic lotions of various descriptions, a whole range of scents for women, and in certain detergent products. Usage tends to be dominated by one or two large processing and compounding houses. The present level of usage is stable and is considered likely to remain so. It was not thought that the sudden recent fall in consumption of patchouli oil by a major soap manufacturer was likely to be echoed in any other quarter, although it is thought that the proportion of patchouli oil used in new formulations would gradually decrease, thereby offsetting the effect of the growth of the perfumery market as a whole. The price ruling at the time of the writer's visit to West Germany*, namely US $27–US $28 (£11–£12) per kilogram was considered close to ideal, although the high prices prevailing in early 1980 had caused considerable anxiety. As long as serious supply problems can be avoided, the future of patchouli oil in the West German perfumery industry seems secure, although without much likelihood of appreciable growth.

1.3.5. The Netherlands

As with many other importing countries, the Netherlands does not record separately its trade in patchouli oil. The only available estimates are those made by members of the trade, and it would appear that national consumption is of the order of 30 tonnes per annum, concentrated mainly in the hands of one or two major processing and compounding houses. Much of this oil enters through the port of Rotterdam, through which entrepôt some additional quantities of patchouli oil pass on their way to other destinations in Europe or North America.

The **Indonesian** oil is clearly preferred to oils from any other sources, although there was some anxiety over the fact that the presence of foreign matter continues to be a problem, that patchoulol levels tend to vary unduly and that the gurjun balsam content can be excessive. A 1% level of gurjun balsam is universally acceptable and sometimes up to 3% is tolerated, but not more. The oil's colour was also mentioned as being an important criterion for Netherlands users. **Chinese** oil, although not much used, is not regarded as necessarily less good than Indonesian oil, but supplies were

*December 1981–January 1982

said to be irregular and one firm mentioned that Chinese suppliers tend to declare the oil 'not available' when the price is too low from their point of view, thus making the supply situation unpredictable. Patchouli oils from other sources are little used in the Netherlands.

Compounding houses in the Netherlands tend to have rather closer ties with Indonesian producers than do their counterparts in other countries, primarily for reasons of close historical connections between the two countries. Netherlands buyers tend to deal with just one or two reputable firms and, where brokers are used, they will normally be of the type who conduct business on their own account and therefore carry the responsibility of insuring against supply difficulties. As Appendix 1, Table 2 shows, relatively little Indonesian oil comes via Singapore although one major Netherlands company makes frequent purchases from a company in Singapore.

The Netherlands processing houses use patchouli oil in a wide range of perfumery, cosmetics and even household products, many of which are eventually exported. The oil is not considered particularly fashion-sensitive and it is mainly regarded as a basic perfumery ingredient. No synthetic competition exists as far as Netherlands processors are concerned. A price level of US $25—US $30 (£11—£13) per kilogram which applied at the time of the writer's visit*, is considered fair and the general view was that the oil is likely to continue to be used at current levels and may be on a very mildly rising trend, although the effects of the aforementioned cutback by a major soap manufacturer had been felt.

1.3.6. Switzerland

The Swiss market for patchouli oil is dominated by two major processing houses and one or two smaller ones. Statistics are unavailable, but local annual usage is estimated to be as high as 40—50 tonnes per annum, although the majority of the compounds and other products into which the product is incorporated are exported. It is very likely that a considerable proportion of Switzerland's requirements are obtained from dealers elsewhere in Europe and in North America.

Indonesian oil is the preferred type, and although a gurjun balsam content of more than 1% tends to cause concern, at least one user mentioned that the olfactive value of an Indonesian oil completely free of gurjun balsam would probably be too low. **Chinese** oil is not considered inferior to Indonesian oil in spite of its differences, and indeed it tends to be regarded as purer, but it nevertheless occupies a minor role, although one processing company buys it for 20% of its requirements. Some of this oil is used in its own right, the rest is blended with Indonesian oil. Some oil is purchased from Singapore but this is of Indonesian origin. Blends of Indonesian and Chinese oil, as are sometimes available from Singapore or Malaysia, are not acceptable to Swiss buyers in the main, as they prefer to do their own blending. Generally speaking, purchases are not made from other origins, although various samples have been seen. On the other hand, it is likely that some oil is purchased, un-reprocessed, from Western dealers and brokers, notably those in France.

Although the Swiss companies contacted had heard of various artificial extenders for patchouli oil, such as synthetic patchoulol, the general view was that supply, quality and price problems experienced over the years were insufficient to warrant serious attempts at replacement of the oil, although it was acknowledged that the oil's importance in new products might gradually decline. In spite of occasional setbacks, therefore, patchouli oil appears to have a stable future in the programmes of Swiss users.

1.3.7. Other markets

Japan. From Appendix 1, Table 5, it will be seen that Japan is a regular importer of patchouli oil, with average annual imports of just over 30 tonnes. These imports were almost certainly destined for the Japanese cosmetics industry, patchouli oil

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*December 1980

being a common base for oriental perfumes. Although **Indonesia** is clearly the dominant supplier, **China** regularly supplies around 3 tonnes per annum and **France** 7 tonnes per annum on average, the relatively high unit values of the latter source suggesting that reprocessed and refined oil of high quality is probably involved. No clear trend in consumption is evident.

India. It is clear from Appendix 1, Table 2, that India has become a major importer of patchouli oil in recent years, her average annual imports from Singapore alone for the years 1975–79 being almost 50 tonnes. Although there has been occasional evidence of shipments of patchouli oil from India to Western destinations, it would appear that most imported oil, together with locally produced oil, is used in Indian cosmetic products for the internal market, the patchouli fragrance being particularly popular.

Other markets. It will be apparent from Appendix 1, Tables 1 and 2, that other importers of patchouli oil include Poland, Pakistan, Spain and one or two other countries. It is also very likely that, as well as Poland, other eastern European countries, including the Soviet Union, are importers of patchouli oil, although statistical information is not available. It is estimated that aggregate consumption in all these remaining markets is of the order of 20–25 tonnes per annum. Trends in consumption in these markets are unclear but they are likely to be similar to those applicable in the markets reviewed in detail above.

1.4. PRICES AND TARIFFS

1.4.1. Prices

Reference should be made to Appendix 1, Table 6 for details of movement in the price of patchouli oil in recent years, and this is in addition illustrated graphically in Figure 1 on page 19. From the table and diagram it will be evident that there have been appreciable year-to-year price fluctuactions with sharp peaks and troughs. Over the years, buyers have come to regard both excessively high and excessively low prices as equally harmful, the latter adversely affecting the morale of the producers and tending to give rise to deterioration of product quality and to a proneness to over-reaction in terms of failure to replant or harvest until market recovery reaches a relatively advanced stage. The last major price peak occurred at the end of 1979 and the beginning of 1980 when supplies of the Indonesian oil were very short, its price at one stage exceeding £20 (approximately US $48) per kilogram c.i.f. United Kingdom. However, there was subsequently a rapid recovery and by early 1981 the price had fallen to around £12–£13 (approx US $28) per kilogram c.i.f. By the early summer of 1981 there were signs of another upward movement, but to a small degree only, and in general a large Indonesian crop was anticipated. By the end of 1981 the price had settled at around US $30–US $32 per kilogram c.i.f. (£16–£17 per kilogram).

Price statistics for Chinese oil have generally been unavailable but, as will already be apparent from earlier sections, users generally only use Chinese oil if its price per kilogram is several dollars below that of the Indonesian oil. However, Chinese prices are sometimes slow to react to market conditions elsewhere and, although the Chinese price followed the Indonesian price very promptly during the 1980 rise, it failed to fall in prompt response to the subsequent fall in the market and for a while the price of Chinese oil was the same as, and even on occasion higher than, that of the Indonesian oil. By April 1981, however, the traditional differential had been partially restored, and at the end of 1981 the price of Chinese 1:11–12 oil was quoted by the trade at US $28 per kilogram c.i.f. (just under £15) and more or less stable.

Most users regard a price range of US $27–US $35 (£14–£18) per kilogram for Indonesian oil as about ideal from the point of view of both producers and consumers and an appropriate Chinese price as at least US $6 (£3) per kilogram below the Indonesian price.

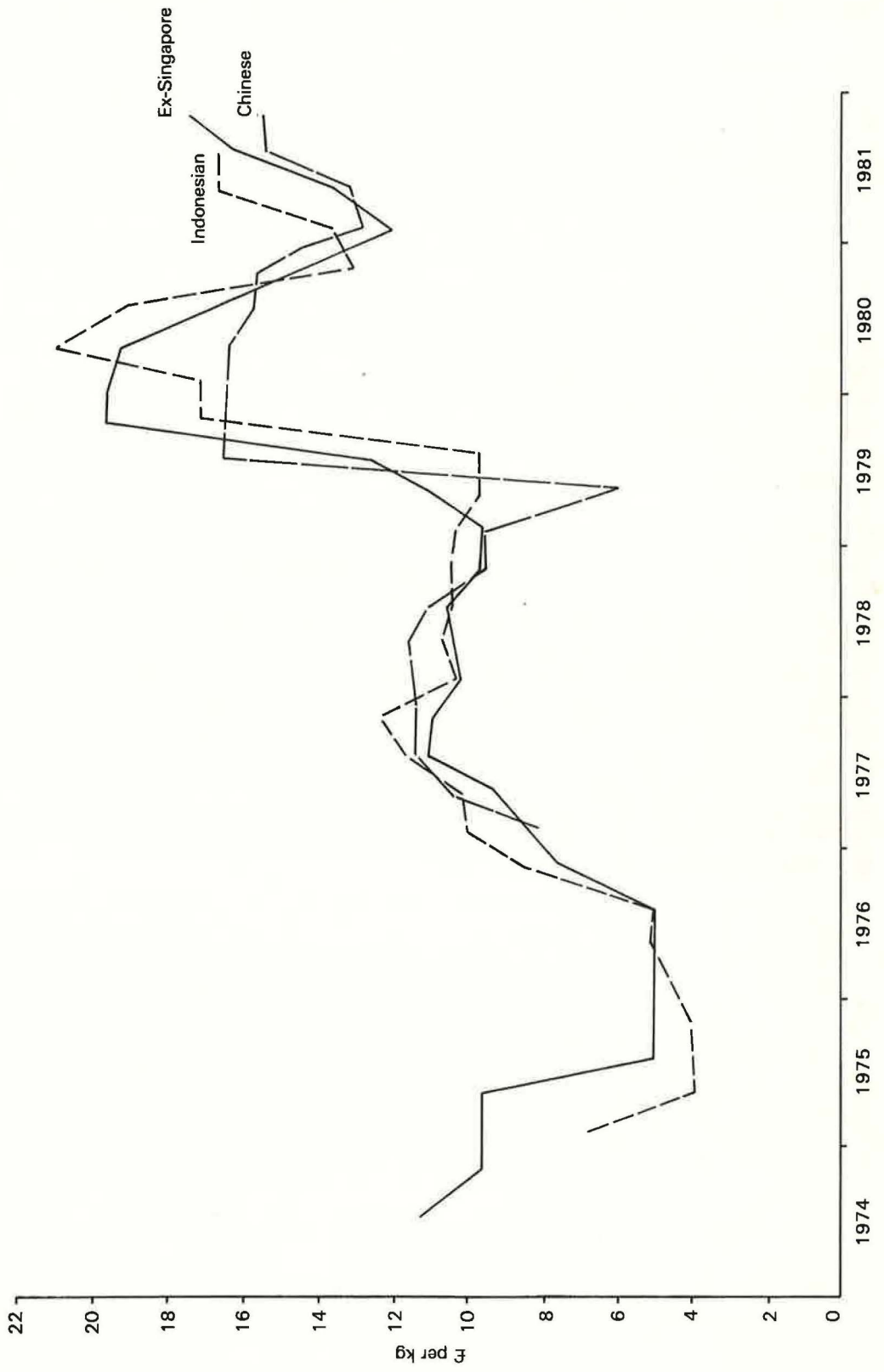

Figure 1
Patchouli oil – forward prices in the United Kingdom, c.i.f. 1974 – 81

1.4.2 Tariffs

Nowadays tropical or subtropical producers of patchouli oil are unlikely to encounter any appreciable obstacles to trade in the form of tariff barriers. Of the countries visited during the course of the field research, only Switzerland levies any tariff on imports of patchouli oil, at a rate totalling 30 Swiss francs per 100 kilograms gross. Imports into the USA and European Community (EC) countries are duty-free.

1.5 CONCLUSION

Although patchouli oil is to some extent a fashion-oriented oil, it is still for the most part regarded as a basic perfumery material. However, as already mentioned in previous sections, it is not wholly indispensable, as a decision by a major soap manufacturer to drop between 25 and 45 tonnes of patchouli oil from certain of its operations clearly demonstrated, and it is important that supply fluctuations are minimised, in order to keep prices stable. Although successful synthetic substitutes for patchouli oil have yet to be produced, it needs constantly to be remembered that synthetic aromatic materials in general have a reputation for stable prices, and this often finds more favour with a cost-conscious perfumer, even if the actual price is relatively high, than do substantial price fluctuations, even if it is sometimes possible to obtain the product at a very low price when the market is depressed. As it is, an increasing number of firms are succeeding in finding ways of gradually stretching natural patchouli oil, using both other natural 'woody' essential oils such as cedarwood oil and one or two carefully selected synthetic compounds, and there is clearly a need for caution and circumspection on the part of the present participants in the patchouli oil trade.

It would not appear as if there are any real prospects for new entrants to the patchouli oil trade since, over the longer term, supplies from Indonesia and China have been keeping abreast of demand, in spite of short term disturbances in the market. While a production base as narrow as that which applies to patchouli oil can tend to be a source of anxiety to buyers, the difficulty of producing a patchouli oil of satisfactory physical characteristics outside the traditional producing areas tends to dissuade buyers from giving too much encouragement to attempts to produce the oil elsewhere, at any rate as long as the performance of established suppliers remains reasonably acceptable. Rumours of a contraction in the Indonesian production base have not been adequately substantiated, and in spite of periodic trade anxiety regarding quality, adulteration and trading procedures, the patchouli oil market seems unlikely to change much in the near future, the anticipated trend in demand being only slightly upward, but stable.

Section 2

Vetiver oil

2.1 DESCRIPTION, USES AND PRINCIPAL SOURCES

Vetiver oil is steam-distilled from the roots of the grass *Vetiveria zizanioïdes* Stapf. which both occurs wild and is cultivated in many parts of the tropics and subtropics. The root, which itself possesses an agreeable odour and has on this account been used by itself or in sachets to scent textiles in parts of the Orient, was at one time imported into Western Europe and North America for distillation, but this practice has now ceased on account of the cost of transporting the root, and distillation now takes place only at source. The preparation of the material for distillation is a laborious process on account of the extreme physical difficulty of digging out the roots and removing from them as much of the residual soil as possible. In some locations, if fact, the effort required to lift the roots is such that it has been difficult to find labourers willing to undertake the task, and this is one reason why it is often difficult to set up a vetiver oil industry in a new, untried location. However, in the established producing areas this problem has been largely overcome and production of the oil has in recent times kept in pace with demand for it without difficulty.

Vetiver oil, like patchouli oil, is one of the perfumer's most basic traditional materials. It possesses fixative properties, that is to say it helps to render the effects of the composition in which it is used long-lasting. The oil's aroma is basically of a heavy woody-earthy character, pleasant and extremely persistent, and it is difficult to reproduce with synthetic aroma chemical formulations. It is used both in fine perfumery and in a whole range of soaps, skin lotions, deodorants and other cosmetic applications. Occasionally it is the dominant contributor to a fragrance but more often it is used to provide a solid foundation upon which other fragrance notes are superimposed. There are one or two flavouring applications, the oil for example occasionally being used in asparagus-type flavours, but the quantities involved are so small as to be insignificant.

Although vetiver oil is commonly used unprocessed, there has been an increasing tendency over the years to use it in the form of one or other of its derivatives. One of its principal components is the alcohol *vetiverol*, and this is sometimes used as a perfumery ingredient after isolation from the oil. More often, however, vetiverol is used as an intermediate in the production of *vetiveryl acetate*, which is now a very commonly-used derivative. The acetylation process by which this compound is produced can also be, and nowadays often is, applied to the whole oil rather than merely to one of its alcohols (vetiverol), and the acetylated oil is then known simply as *vetiver acetate*. Both vetiverol and the two acetates have softer odours than the basic oil, and are used in higher class, more expensive products and, as would be expected, they are more expensive than the oil as such. The preparation of these derivatives involves fairly intricate operations and is therefore undertaken mainly in the importing countries, and even by the individual companies intending to use the derivatives.

Apart from the preparation of the aforementioned derivatives, it is possible to refine or reprocess the whole oil in order to improve its odour, and some firms, especially

in France, carry out this type of operation. Terpeneless vetiver oils, however, are virtually never produced.

The main sources of vetiver oil nowadays are Haiti, Indonesia (Java), Réunion, Brazil and China. India has also produced the oil with reasonable regularity but has never been an appreciable influence in international trade, while Guatemala, which was once an exporter, no longer produces the oil. Occasionally the oil has been produced in other countries in Asia, the Indian Ocean and in Central and South America, but seldom or never in sizeable or sustained quantities. Although no reliable published statistics are available, all the available evidence suggests that annual world production of vetiver oil is currently of the order of 245–265 tonnes, and world exports 235–255 tonnes. The following section contains a brief account of the present situation in relation to each of the producing and exporting countries.

2.2 PRODUCTION AND EXPORTS

2.2.1 Haiti

Haitian vetiver oil is generally regarded as the best of the large volume vetiver oils although not quite as good as the 'Bourbon' oil produced by Réunion. In recent years it has enjoyed a dominant position in the market and, although estimates have varied, it is clear that annual production of vetiver oil in Haiti is on average around 100 tonnes, all of which is exported. Its vetiverol content is usually in the region of 53–54%, which although not as high as that associated with oil from Réunion, is high enough to commend it strongly to perfumers throughout the Western industrialised countries.

Haitian oil is frequently used as an oil in its own right, but many users stress its extreme suitability for the production of vetiver acetate or vetiveryl acetate and, occasionally, of vetiverol for use in its own right. The quality of the oil tends to be more consistent than does the quality of oils from some other sources and it tends to be used in rather more extensive intermediate products and end-products than do oils of, say, Indonesian or Chinese origin.

On the other hand, the strongly centralised marketing structure of the Haitian industry, together with the fact that – probably for that very reason – the bulk of the oil tends to be handled by a relatively very limited number of dealers and agents in the importing countries, has not always worked to the advantage of the Haitian vetiver oil trade. Periodic communication problems, high officially-fixed price levels, and reported lapses in standard trading procedures – for example, the occasional tendency for consignments not to match the corresponding samples – have caused some users to diversify away from Haitian oil and there is no doubt that demand for this oil has recently noticeably slackened. This process was reinforced by an unfortunate recent sequence of events in which a temporary shortage of Indonesian oil drove the price of vetiver oil to high levels, thereby precipitating an unprecedented level of production and stockpiling of the oil in Haiti. Members of the trade have commented that at one point 500 drums were being held in stock at the principal port as the exporters apparently attempted to drive the price even higher. At the time of writing,* stock had been largely run down. Prices fell very sharply, indeed excessively, and although a return to normality had occurred by the end of 1981 it is clear that this episode and the previous periodic difficulties had led many perfumers to question the wisdom of excessive dependence on vetiver oil as a basic perfumery material. Increasingly there has been evidence of less rigid marketing practices in Haiti and the communications problem seems to have eased somewhat, so it may well be that the damage to the trade will prove to have been of a limited nature, particularly if the long-term price of Haitian oil proves more flexible than it has been in the past.

* December 1981–January 1982

2.2.2 Indonesia

Indonesian vetiver oil is produced on the island of Java. Production there is long established and exports in recent years have averaged around 100 tonnes per annum, placing it alongside the Haitian oil in terms of importance in trade, although until recently it ran second (*see* Appendix 1, Table 7). The marketing problems already described in relation to Haitian oil have worked to the advantage of the Indonesian producers, and demand for vetiver oil from this source has increased.

In spite of the recent upswing in demand for the Indonesian oil, it has tended to have a reputation for more variable quality than has been the case with the Haitian oil. The amount of care taken over the distillation process depends very much upon the ruling price and there have been very substantial price fluctuations. Problems with burnt odour, low vetiverol content, high acidity and the presence of foreign matter and contaminants have all been sources of periodic anxiety on the part of users, although trading procedures, normally entailing shipment direct to destination rather than via Singapore, in marked contrast with the case of patchouli oil, seem generally to have operated satisfactorily. The quality of Indonesian oil was reported to have deteriorated in the period prior to the time of writing,* vetiverol contents being low (47–48%) and acid numbers high. This has probably resulted from cash problems for the producers caused by rising costs in conjunction with sometimes uneconomic world prices; they appear to have resorted to premature harvesting and probably take less care during processing than formerly.

Although the Indonesian oil clearly does not enjoy the same reputation as the Haitian oil, it is nonetheless widely used, both in its own right and as a starting material for the preparation of isolates and derivatives. Both the oil and its derivatives are used in a range of products broadly similar to those applicable to the Haitian oil although at the cheaper end of the market. Sometimes it is blended with Haitian oil but it is certainly not regarded as a true substitute for it. Its increasing popularity in recent years has been particularly noticeable in the USA and France, at any rate on the basis of the published import statistics.

Continued regular production of Indonesian vetiver oil will depend to some extent on the long-term level of the international market price which, at the beginning of the 1980s, in the immediate wake of the release of most of the Haitian stockpile on to the world market, had slumped to levels which discouraged the Indonesian producers from planting at all. By the end of 1981, however, the price had recovered and the outlook was more promising.

2.2.3 Réunion

Like other essential oils produced in Réunion the locally-distilled vetiver oil is widely known by the appellation 'Bourbon'. Bourbon vetiver oil is traditionally the world's best, on account both of its odour and of the fact that its vetiverol levels are frequently in excess of 60%. Production levels have always been limited, and the price of the oil has almost always been substantially higher than those of vetiver oils from other sources; also, as in Haiti, there has been an element of official fixing of the price. In recent years, however, production of Bourbon oil has been in steady decline, mainly because users are increasingly unwilling to pay the high price, but also because ageing equipment and the need for economies in the production process as a result of rising labour costs have combined to bring about a significant fall in the oil's quality. While the quality is still very good, that of the Haitian oil is not far behind it, and in any case increasingly sophisticated blending and modification techniques have reduced the need for oil of the very highest quality.

Currently annual production of the Bourbon vetiver oil is estimated, on the basis of trade opinion, to average between 17 and 25 tonnes annually. An increasing proportion of total production is destined for the French market.

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* December 1981–January 1982

2.2.4 China

It is not clear for how long China has been a producer of vetiver oil, but imports from this source were recorded intermittently throughout the 1970s. On the basis of various trade opinions, the current production level has been estimated as 20–30 tonnes per annum, of which perhaps three-quarters is exported.

Chinese vetiver oil does not, in general, find much favour with Western users, although oil from Kwangtung Province is reported to considerably better than that emanating from Shanghai Province. Its acid content tends to be on the high side, partly as a consequence of which the vetiverol content tends to be low and the potential yield of the derived acetates is therefore also low. However, since the price of the oil is usually low in relation to that of vetiver oils from other sources, it succeeds in finding a limited demand, mainly for blending purposes and for the isolation of vetiver acetate, in spite of the low yield. As is to be expected, it is used mainly in low-cost formulations.

The apparent level of average annual imports of Chinese vetiver oil into the countries reviewed in detail is, in aggregate, well below the estimated level of Chinese exports, and it would therefore appear that a larger proportion of Chinese oil finds markets outside the main Western industrialised countries than is the case with oils originating in Haiti, Indonesia or Réunion.

2.2.5 Brazil

It is not clear when production of vetiver oil commenced in Brazil, but there is now a steady commercial operation there, although estimates of total production vary widely. The quality is said to be better than that of the Chinese oil and certainly competitive with that of the Indonesian oil. A substantial proportion of this oil is destined for Brazil's internal market, where there is growing demand for cosmetics, while Brazil's fairly rigorous import controls are also likely to have an influence. Even so, small quantities, almost certainly considerably less than 10 tonnes per annum, of the oil have reached the international market, where it is used mainly for blending and for extraction of vetiver acetate and vetiveryl acetate. However, it tends to be a comparatively expensive oil and, as its odour is generally regarded as only moderately good, there is relatively little interest in it and its most favourable prospects would appear to be on the Brazilian market and possibly in one or two other South American markets.

2.2.6 Other sources

Angola. Until the early 1970s Angola was a regular supplier of vetiver oil to the international market and its price was regularly quoted. Since the Angolan Civil War, however, supplies have dwindled to zero and have shown no signs of recovering. Angolan oil had a regular following among users although it sometimes tended to be dark and viscous.

Zaire. Production of vetiver oil in Zaire, which was never of a major order, had declined to zero by the early 1970s. Production had been undertaken on a regular basis under Belgian management, but the operation appears to have closed down without likelihood of recommencement.

India. An Indian vetiver oil was regularly traded at one time and was widely known. Nowadays production is very intermittent and on a very small scale. However, the import statistics show that the trade continues, even if many years may pass without a single record of a consignment. The quality of the oil is generally regarded as indifferent, while its price has tended to be too high for production of either of the derived acetates to be economic. It is not known whether India has any plans for increased production of the oil.

Guatemala. Vetiver oil production took place in Guatemala up until the early 1970s and it would appear that around 5 tonnes were exported annually on average but,

as with patchouli oil and some other essential oils, production in Guatemala declined to zero. There is no indication that production will recommence.

Singapore and Malaysia. Comparatively small quantities of vetiver oil, mostly of Indonesian origin, are re-exported from Singapore, but it is unlikely that any is produced there. Malaysia may well have produced some vetiver oil in the past but virtually none comes on to the international market from there nowadays and, if any is produced now, it is almost certainly consumed locally. Comparatively high labour costs in Malaysia tend to militate against economic local production of this type of product.

The Republic of South Africa. From the US import statistics it is clear that there is a small vetiver oil production operation in the Republic of South Africa, but the quantities are extremely small and there have been no signs so far of any serious attempt to increase production, although one buyer thought there might be plans for expansion. The quality of South African oil is said to be very high and close to that of Bourbon oil.

Other sources. Although at various times vetiver oil production has been attempted elsewhere in Asia, the Indian Ocean and Caribbean Islands, Central America, South America and even on an experimental basis in the southern USA, the operations seldom if ever proved to be of any commercial significance. France no longer distils vetiver oil from imported vetiver root and although there have been suggestions that there may be a very small production operation in Martinique, geared exclusively to the French market, this could not be confirmed. There had been reports of a possible forthcoming attempt to produce and market a 'Bourbon' quality oil in Egypt, but again this has not been confirmed.

2.3 MARKETS AND PROSPECTS

2.3.1 The USA

The USA is the largest consumer of vetiver oil. There is said to be a re-export trade from New York (averaging probably 15 tonnes per annum) but nonetheless the import figures given in Appendix 1, Table 9, can be regarded as a reliable guide to trends in domestic consumption. This is currently estimated, on the basis of trade opinion, at around 100 tonnes per annum. It will also be clear from the import statistics that US imports during the latter half of the 1970s were substantially higher than imports during the first half of the 1970s.

Appendix 1, Table 9 also shows that, while Haiti continues to be the main source of US imports, the Indonesian share of the market has increased very markedly since 1976. This development is a reflection not so much of any major improvement in the quality of the Indonesian oil, as of the over-rigid Haitian trading practices and the often unacceptably high price of Haitian oil. Generally speaking the Indonesian and Haitian oils have not been regarded as interchangeable by US users, particularly where the oils are used unprocessed, but Indonesian oil is increasingly highly regarded for the preparation of vetiver acetate and vetiveryl acetate, and there is an increasing degree of interchangeability between the Haitian and Indonesian oils for the preparation of these derivatives. Some users blend the two oils, but there are no clearly identifiable circumstances in which they choose to do so. Generally speaking the Indonesian oil is used in products destined for the cheaper end of the market, and both oils are more likely to be used *per se,* unprocessed, for the less expensive applications. The use of Bourbon vetiver oil in the USA has in general been in slow decline, although for many high-class perfumery applications it is still preferred. The Chinese oil is for the most part disliked, while the Brazilian oil, although regarded as of fair quality, is not available in large enough quantities, or at sufficiently attractive a price, to attract more than very occasional attention. The Guatemalan oil was purchased by US users while it was available but it has long disappeared. Of the other suppliers, only France is of importance, as the figures show, but it is clear from the unit values that imports from this source are of exceptional quality and almost cer-

tainly consist of oils carefully reprocessed and refined by the French essential oils industry. There are signs that dependence on this source may be decreasing.

Vetiver oil is very widely used in the USA, from the large soap manufacturing companies down to the small firms which undertake such operations as the perfuming of handkerchiefs. It is noteworthy that the major soap manufacturers are the main users of the oil in its unprocessed form, the more exacting users tending to demand the use of the prepared acetate derivatives or occasionally of vetiverol. During the 1970s a rumour emerged to the effect that vetiver oil could have harmful effects on the human skin, and since photosensitisation was, and remains, an issue on which the US health laws have taken a firm stand, there was some anxiety in the trade. The allegations about the effect of the oil were never proven and the rumours faded away fairly rapidly, but the episode may have had a permanent, if small, effect on the long-term level of demand for the oil. Opinions on the future of the oil varied, but few users predicted any appreciable increase in its use, notwithstanding the apparent increase in consumption during the 1970s, and some felt that consumption would gradually decline as perfumers steadily sought to introduce new basic materials, with more stable supply and price characteristics, into new formulae. Completely synthetic vetiver oils are not available, as is the case with most woody-type essential oils, but rough approximations to certain constituents such as vetiverol and vetiverone have been successfully produced and one company is reported to be making regular and successful use of a synthetic extender. Other companies have sought to reduce their dependence on the oil through the introduction of larger quantities of other natural products such as cedarwood oil and its derivative cedrol acetate. There is no doubt that the US trade's view of Haitian pricing policy and marketing methods on the one hand, and the variable quality of the Indonesian oil, on the other, have combined to bring about a steady erosion of trade confidence in the oil, and although it could continue in regular and large-scale use indefinitely if these problems diminish appreciably, recent experience has not been very encouraging.

Indonesian vetiver oil is handled throughout the New York trading network but there has been a tendency for the Haitian oil to be handled by one or two dominant firms in the trade. Generally speaking, the trading structure for vetiver oil appears to operate smoothly and satisfactorily.

2.3.2 The United Kingdom

From Appendix 1, Table 10, it will be seen that United Kingdom imports of vetiver oil have ranged from 21 to 25 tonnes per annum in recent years. Imports are mainly consumed domestically, although there are periodic re-exports of small consignments. The main sources are Indonesia and France, imports of the latter generally being of high-quality rectified oils and therefore of high unit value. Consumption of Haitian oil is of comparatively minor importance and supplies of oil from Haiti are almost invariably obtained from US dealers and brokers rather than direct. Chinese oil is regularly imported and there is proportionately a significantly greater dependence on this oil than was evident in the USA.

In spite of the comparatively small quantities of Haitian oil used in the United Kingdom, it is plain that it is definitely preferred to the Indonesian oil and would be used more widely if there were fewer supply problems arising from the Haitian marketing system. Bourbon oil is very highly regarded but, as in the USA, demand for it has declined over the years on account of its high price, most users maintaining that the special qualities of the Bourbon oils are required increasingly rarely. Opinions of the Chinese oil varied greatly, but one major user liked its special character and, provided there are no undue supply problems, it is likely to continue to be used.

As elsewhere, vetiver oil is used in the United Kingdom both in its own right and in the form of its derivatives such as vetiver acetate, although firms differ greatly in the proportions in which they use the various forms of the oil. They also differ substantially in their views as to the substitutability of the various oils, although it was generally agreed that there was a greater degree of interchangeability where production of derivatives were involved, than where the oil was to be used direct in

its own right. It proved impossible to establish the nature of the difference in application as between oils from different sources, but it was clear that the Bourbon and Haitian oils, on the one hand, and the derivatives of the oils as distinct from the unprocessed oils, on the other hand, were generally used in the more expensive applications. United Kingdom usage of vetiver oil and its derivatives is fairly typical of the world-wide pattern, it being mainly used to provide a 'woody' type basic note in a whole range of fragrances for cosmetic products, soaps, aerosols and even household products. Usage in flavouring is insignificant although not unknown. Consumption does not appear to be increasing and it was commonly remarked that synthetic extenders are available and already in use, although completely synthetic vetiver oils are unknown. It is clear that, as in the USA, perfumers are endeavouring to reduce their dependence on the oil, in spite of its unique character.

United Kingdom imports of vetiver oil are handled by many firms in the trade, but some of the larger users are increasingly entering into direct trading agreements with the exporters in the source countries.

2.3.3 France

Reference to Appendix 1, Table 11, will show that France is a major importer of vetiver oil, and virtually on a par with the USA in this respect. Unlike the USA, however, France has a major re-export trade in vetiver oil (See Appendix 1, Table 8), around half of total imports eventually being re-sold to other countries either unprocessed or, more frequently, after being re-distilled and refined. Annual consumption by the French perfumery industry is around 50 tonnes currently, and exhibiting no tendency to increase appreciably.

The French perfumery industry has a greater interest in the Bourbon oil from Réunion than has any other industry, and the greater part of Réunion's exports are destined for France. This oil is used for the most exacting applications in high-class perfumery. In volume terms, however, it is the Haitian oil which is most used, usage of Indonesian oil being about one-quarter or one-third less than that of the Haitian oil. The Brazilian and Chinese oils, as can be see from the table, are well known in France and used with fair regularity, but in general they do not command great interest and no long-term increase in their consumption is anticipated.

French trade opinions confirmed that consumption of vetiver oil is unlikely to increase, since there is a tendency towards the use of cheaper starting materials where this is feasible. This points to the likelihood of a progressive decline in usage of the Bourbon oil and the application of more sophisticated improvement techniques to the cheaper oils, and also to the increasing usage of extenders. As in the USA and the United Kingdom, no completely synthetic vetiver oils were known, but cedarwood oil and its derivatives, as well as some other materials, were said to be attracting some attention as sources of alternative base notes of the 'woody' type for perfumes. However, the French perfumery industry is more conservative than most and, even if consumption is unlikely to increase appreciably, there is also unlikely to be any significant fall in local consumption of vetiver oil.

Most of the French essential oil dealers and brokers handle vetiver oil, but it would appear that the major proportion of imports are handled by large firms in Marseille and Bordeaux, and to a lesser extent in Paris. These firms also handle the bulk of French re-exports, which are destined for a very wide range of countries in the Americas, Western and Eastern Europe and the developing world.

2.3.4 The Federal Republic of Germany

Statistics for imports of vetiver oil into the Federal Republic of Germany (West Germany) are given in Appendix 1, Table 12. It will be clear that West Germany is only a minor consumer of vetiver oil, especially when allowance is made for a small re-export trade, although some trade comments implied that there is a proportionately greater level of imports of ready-made perfume compounds into West Germany that into some other countries, and additional quantities of vetiver oil may enter in this form. As it is, a very large proportion of West German imports, which have aver-

aged 6 tonnes per annum in recent years, are of expensive redistilled and refined oils from France, and it is clear that imports of vetiver oil direct from the main source countries such as Haiti and Indonesia are minimal.

Of the basic oils, the Bourbon is clearly favoured, particularly for use direct in its own right, and it is likely that a large proportion of the vetiver oil imported from France is of Réunion origin. Haitian oil is highly regarded, both as an oil in its own right and as a source of vetiver acetate, whereas opinion of the Indonesian oil was generally unenthusiastic, this oil generally being used as a cheap source of vetiver acetate. Chinese oil is known in West Germany but, although one firm had a high opinion of it, most expressed little interest in it, and the same comments apply to the Brazilian oil. Generally speaking, the oils from the various sources are not regarded as interchangeable except in one or two instances where a derivative such as vetiver acetate is required.

As in other markets, vetiver oil is used in West Germany primarily as a base material in soap fragrances, men's lotions and deodorants and in a wide range of general perfumery applications. There is no clear trend in consumption, but all the evidence suggests that it is stable and likely to remain so.

Imports of vetiver oil into West Germany are handled by the major dealers in Hamburg and Bremen, although some of the major perfumery and compounding houses import their requirements direct.

2.3.5 The Netherlands

Netherlands imports of vetiver oil are shown in Appendix 1, Table 13 and can be seen to be slighly less than those of West Germany, averaging 5 tonnes per annum in recent years. As is the case with West Germany, it is possible that additional oil may be imported incorporated into perfume compounds and as such may not be recorded.

Consumption of vetiver oil in the Netherlands is restricted in the main to one or two large processing and compounding firms, most of whom have operations throughout the world. It will be seen from Appendix 1, Table 13 that the USA is the main supplier, which suggests that most of the Netherlands' imports are ultimately of Haitian origin. Trade opinion confirms this fact, which is perhaps a little surprising on account of the Netherlands' close traditional ties with Indonesia, which nowadays supplies only extremely small quantities. Vetiver oils from other sources are generally unknown in the Netherlands, although from time to time a consignment of high-quality improved oils from France is purchased.

Vetiver oil is regarded as a good general-purpose oil by Netherlands users. It is said to be little influenced by fashion movements and to be at present under no obvious threat from synthetics. There are no special uses, and the general uses already described apply in the Netherlands. However, the processing firms' opinions tended to confirm the general impression that proportionately less of this oil is used in perfume compounds by Netherlands perfumers than is the case in other countries. There is very little blending of oil from different sources and the greater part of the oil consumed is converted to vetiver acetate or vetiveryl acetate before use, implying that in the Netherlands vetiver oil is perhaps more used for products at the upper end of the market.

The major companies tend to have direct contacts with overseas suppliers, but the small intermediate essential oils traders in Amsterdam and Rotterdam still handle steady, if small, quantities of the oil.

There is no sign of any appreciable long-term upward trend in consumption of vetiver oil in the Netherlands. Although synthetic substitutes are unknown, extenders exist and their use is slowly increasing in new products. It is probable that consumption of the oil will continue at present levels.

2.3.6 Switzerland

Consumption of vetiver oil in Switzerland is dominated by one or two large processing companies, which produce a wide range of perfume and flavour compounds for the broad European market rather than for the internal Swiss market, which is extremely limited as would be expected in view of the small population. Annual imports into Switzerland are estimated at rather over 30 tonnes, that is to say substantially more than for West Germany or the Netherlands. Published trade statistics for vetiver oil are not available in the case of Switzerland.

The Indonesian oil is most commonly used in Switzerland, with perhaps two-thirds of the market, followed by Haiti and China in that order. Consumption of Chinese oil is of the order of 5 tonnes per annum which is relatively large, although it was acknowledged that it presented problems in terms of its high level of acidity. Bourbon oil is used in only small quantities, and oils from other sources are but rarely purchased. Chinese oil is often blended with Indonesian oil before use.

The pattern of usage is fairly typical of that applicable elsewhere. Most of the oil is acetylated before use, and an adequate vetiverol content as well as good odour is an important criterion for the buyers. One buyer stated that a relatively high acid content was not necessarily an impediment if the oil were to be used for the extraction of derivatives rather than used direct, although there was not universal agreement in this respect. The level of usage is fairly steady at present but, in contrast with opinions expressed in, for example, the Netherlands, there was a view that vetiver oil is relatively fashion-oriented and may be liable to replacement in the event of severe marketing problems, although little information was forthcoming as to the precise extent to which the oil could be replaced or extended, or as to the nature of the alternative materials. As elsewhere, the long-term consumption trend does not appear to be an upward one.

As a general rule, Swiss buyers purchase vetiver oil direct from source but in the case of Haitian oil it is still usual to use dealers and brokers in North America and elsewhere in Western Europe.

2.3.7 Other markets

Japan. Appendix 1, Table 14 shows that Japanese imports of vetiver oil have ranged from 8 to 15 tonnes per annum in recent years. Virtually all imports are used for internal consumption. France is the principal supplier, followed by Indonesia. It will be apparent from the figures that the unit value of imports from France is consistently higher than that of imports from Indonesia, which, although partly a result of differences in the shipping cost component, is almost certainly also due to the fact that the French oils have been improved by redistillation and refining. Japan was not visited during the writer's survey but it is known that there is a steady demand for vetiver oil from Japan's perfumery industry, and it may be slightly increasing over time.

Other markets. The market for vetiver oil elsewhere appears to be of the order of 30 – 40 tonnes per annum, and is likely to be located mainly in Western European countries not covered in the above analysis, in Eastern Europe, including the Soviet Union, in parts of Latin America and in Asia. A fairly large proportion of the requirements of these markets is likely to be serviced by France, which, as already indicated, has a sizeable re-export trade. Unfortunately no information is available on trends in these markets, and although it is possible that there may be more of an increasing trend in consumption than in the established markets, no evidence was available to suggest that this could influence greatly the overall prospects for the oil, which are discussed in the Conclusion.

2.4 PRICES AND TARIFFS

2.4.1 Prices

Reference should be made to Appendix 1, Table 15 for details of price movements in vetiver oil in the main sources in recent years, and to Figure 2 on page 27 for a corresponding graph. The substantial range over which prices have moved will be clearly evident. It will also be clear that the Bourbon oil from Réunion has generally been by far the most expensive, and Indonesian oil the cheapest. However, prior to 1977, the price of Indonesian oil had been considerably lower, and the rise in its price that occurred at the beginning of that year was the principal cause of the subsequent boom in Haitian production and stockpiling, which in turn eventually gave rise to the aforementioned very sharp fall in the price of the oil The price of Bourbon oil has to some extent tended to reflect fluctuations in the price of the cheaper oils, although at a higher general price level. The price of Chinese oil is not often quoted in the trade press.

The very low price of Indonesian oil ruling at the beginning of the 1980s was said to be well below the cost of production and a rise was inevitable, while the sharp corresponding fall in the price of Haitian oil also appears to have overshot the equilibrium point. These fluctuations are typical of the 'cobweb' cycle of production and price movements which apply to so many natural products, and have not engendered confidence among buyers. At the time of writing* there had been a substantial rebound in the price of Indonesian oil, it being quoted at US$33 (£17) per kilogram c. and f. Haitian oil, after a further fall, had recovered to in excess of US$50 (£26) per kilogram but the price of Chinese oil remained low at US$23 (£12) per kilogram. The strong upward movement in the price of Bourbon oil during 1979 and 1980 at a time when those of other vetiver oils were falling, reflected local supply shortages together with an unwillingness on the part of users of the Bourbon oil to turn to other sources.

Prices for vetiver acetate are sometimes quoted in the trade press, but it will be sufficient for the purposes of this report to indicate that the cost of producing it is around US$20 – US$25 (£10 – £13) per kilogram and that its market price is therefore usually a little more than US$25 per kilogram higher than that of the oil from which it was made.

2.4.2 Tariffs

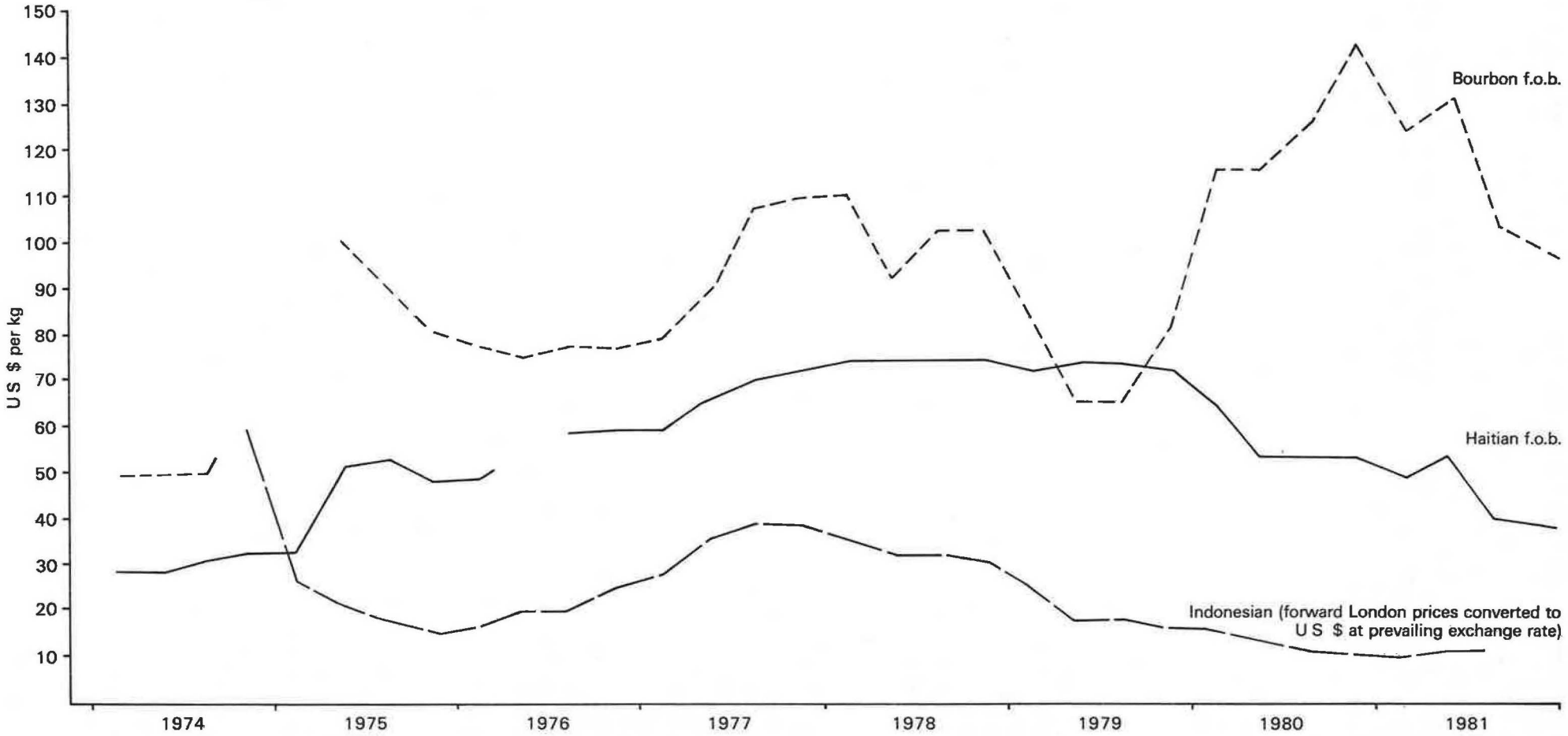
Of the various importing countries studied, only Switzerland levies a tariff on imports of vetiver oil, at the rate of 10 Swiss francs per 100 kilograms gross. Imports into the USA and EC countries are duty-free. Nowadays tariffs are unlikely to constitute any appreciable obstacle to international trade in vetiver oil.

2.5 CONCLUSION

There seems little room for doubt that future prospects for world consumption of vetiver oil would have been more favourable than they are, had there been fewer fluctuations in supply and price levels. Perfumers have long appreciated the relatively stable price levels that apply to synthetic aromatic materials, and they are increasingly seeking to ensure that at any rate the really important basic materials used in perfume compounds are likely to be available in dependable quantities and at reasonably stable prices for the foreseeable future. Vetiver oil is certainly one of the perfumer's traditional 'foundation stones' and it is for this very reason that the recent history of the oil has engendered misgivings and a noticeably increased tendency for users to seek alternatives. While it remains true that vetiver oil, like many other oils with a 'woody' character, at present defies accurate synthesis and cannot be replaced in existing formulations by a synthetic substitute, it is likely that perfumers will seek to use progressively less of the oil in new products, and for this reason the present level of world demand is unlikely to be exceeded in future years.

* December 1981–January 1982

Figure 2
Vetiver oil – prices on the U S market, f.o.b. New York, 1974 – 81



Source: Appendix 1, Table 15

The prospects for new producers of vetiver oil would seem to be rather poor, as the existing producers can easily service the current level of world demand. Moreover, even if the current level of production were to fall on account of a prolonged period of unrealistically low prices, as seemed possible prior to 1981, it is most unlikely that vetiver oil production elsewhere could be economically attractive, as the costs of production in Indonesia and Haiti are about as low as they could possibly be. Only in the event of a sharp decline in production in these traditional sources arising from the development of lucrative alternative sources of employment, for example in tourism, would there by any real opportunities for a new producer.

Section 3

Trading structures and procedures

3.1 GENERAL

To market any essential oil successfully, it is fully as important that the nature of the channels and procedures via which the oil passes from the distiller to the end-user is understood, as that the size of the market is known. Many potentially successful essential oil undertakings have failed solely on account of a faulty understanding of the operation of the market. While there are not at present favourable prospects for additional producers of either patchouli oil or vetiver oil, this situation could change over time and it would then be imperative, especially in view of the current tendency of perfumers to reduce the proportionate quantities of these oils used in new lines of products, that new suppliers are fully aware of the nature of the market from the outset.

It must be emphasised that nowadays it is most important that new producers of essential oils should make a practice of establishing and maintaining a constant and two-way flow of communication with the main end-users, or with the key intermediate links in the trading chain, who will normally be dealers, but might on occasion be brokers, export houses or general produce merchants in the importing countries. Any producer who is contemplating the production of a known commercial oil in an untried location, or the substantial expansion of existing production, needs both to ensure that a sufficient number of buyers are in basic sympathy with the scheme and also, assuming the scheme does have support, that the oil is supplied in the required quantities, in the preferred types of package, at the right time and, of course, within the accepted quality standards and specifications. Correct documentation and payment procedures are also of paramount importance and need to be the subject of advance negotiation. The improvement in international communications is steadily removing many of the difficulties formerly encountered in maintaining close and constant contacts along these lines; without such contacts, the chances of a successful and lasting trade being established are greatly reduced.

Although neither patchouli oil nor vetiver oil ranks among the largest-volume essential oils, the volume of trade in each case is sufficiently large for the number of participants in the trade to have become considerable, and these oils are typical of essential oils generally in the manner in which they are traded. It will also already be evident that at any rate some of the consuming countries individually import more than they consume; on account of their function to a greater or lesser degree as entrepôts in essential oils, a proportion of their intake is subsequently re-exported to other countries. This supplements the special role of traditional entrepôt centres such as Singapore, where internal consumption is very minor in relation to the re-export trade, although here it should be noted that the role of Singapore in this respect is in marked decline. A certain amount of re-export trade can play a part in the minimisation of the irregularities and imbalances in trade brought about variously by seasonal shortages, inadvertent overstocking and sudden peaks in demand in a particular country. It should be understood, however, that the use of the term 're-exports' does not necessarily imply that the oil is imported no further than a bonded warehouse, although this is certainly implied by the traditional, formal

definition of the word. Many dealers import the oils directly into the countries where they are physically located, and then subsequently re-export them if orders are received. In some cases the oils may be cleaned, filtered, or further refined before re-export. This is not to suggest that there is no true re-export trade in the traditional sense, but rather that it may not necessarily be more than a fairly small proportion of re-exports in the wider sense. Nonetheless, there still exist one or two Western ports in which a substantial amount of the traditional type of re-export trade is undertaken, a major example being Rotterdam in the Netherlands.

The basic marketing chain applicable to essential oils can be summarised as follows:

A Exporter
B Entrepôt (e.g. Singapore)
[C Commissioned broker/Agent]
D Dealer or Merchant
[E Commissioned broker/Agent]
F Processing/Compounding house
G End-products manufacturer (who may buy the oil already incorporated into a perfume compound)

The terms used are as defined and understood by the United Kingdom trade. Elsewhere, some of the terms may carry a slightly different meaning, for example, the terms 'agent' and 'broker' in the USA.

The brackets around 'C' and 'E' indicate that the oil does not normally pass physically through the hands either of brokers or of the overseas agents of producers or exporters (the latter are now very rare), although there are exceptions to this rule. It is not even necessary for the goods to pass through the country in which the broker or agent is located; for example, a London-based intermediary could negotiate a trading agreement between an Asian producer and a Continental European buyer, the goods being shipped direct, only the documentation passing through London.

In some cases there can be more than one dealer or merchant in the chain, with or without a corresponding additional broker or agent. This often occurs as a result of re-export trade, defined in the broader sense as outlined in the previous paragraph, and is sometimes necessary to correct stock imbalances. The link between 'F' and 'G' is usually direct (as shown), it being in the nature of the industry that end-product manufacturers normally enter into direct agreement and contracts with processors, although there are end-product manufacturers who do their own blending, in which case stage 'F' is by-passed. Direct 'A–G' links are uncommon at present, and although direct 'A–F' links are becoming more common, the brokers, agents, and in particular the dealers and merchants, continue to retain their importance in the trade. The most common marketing chain is probably 'A–[C]–D–F–G', although in the case of patchouli oil the 'B' link, that is to say Singapore, is also of considerable importance. It is unusual for brokers or agents to feature twice in the progress of a consignment from exporter to final user.

Under the sustained influence of price inflation in recent years there has been a certain amount of pressure in favour of a reduction of the number of links in the marketing chain, in order to reduce the impact of intermediaries' commission or mark-up in the final price. Even smaller firms, who formerly would have regarded themselves as possessing insufficient resources for direct contacts with the exporters in the producing countries, have in some cases attempted to open direct lines of communication with the producers, although a fair proportion of such attempts have only served to prove that the increased inconvenience and cost of such communications tends to eclipse the intended savings. In general, only those firms handling relatively large quantities of essential oils such as patchouli oil or vetiver oil have found that the savings sufficiently outweigh the cost and inconvenience of by-passing dealers. Only in the event of the major end-users taking on a much greater proportion of their own perfume compounding – and the trend would appear to be otherwise – could there be a major decline in the role of dealers and merchants in the

world essential oils trade. Some continuation of the slow decline in the importance of the intermediaries seems a possibility, however. In the case of brokers, it is link 'E' rather than 'C' which will be more prone to a diminution in importance, on account of the relative ease with which both small and large compounders and end-users can make direct contact with dealers and merchants, but even the 'C' link may decline further. On the other hand, it is unlikely that the true brokers will disappear altogether, for many users or compounders who could not afford direct links with exporters could afford 'half-way' arrangements, involving the use of a single broker or agent between them and the exporter. It is, however, the role of dealers and the larger merchants in the monitoring of the quality of individual brands of oil that is particularly appreciated in the trade, and the ability of intermediaries in general to arrange financing is also widely valued.

For both oils trading may take place on either a 'future delivery' or 'spot' basis, the former involving an agreement on a firm price for delivery at a specified future date, the latter involving purchasing direct from a dealer's or merchant's existing stock. Normally higher prices are payable on the spot market, recourse to this market usually being made when very small quantities of the oils are required or when supplies are needed very urgently. Payment may be made either against documents (c.a.d.) or on a 'Letter of Credit' basis, considerable variation in practice being encountered in this respect. The method chosen is a matter for individual negotiation between the parties involved.

These comments apply broadly to both the oils covered in this report. A few additional comments in relation to the individual oils will be appropriate, however.

3.2 PATCHOULI OIL

The production and export of the Indonesian oil is undertaken by a considerable number of producers and exporters, the main producers being smallholder farmers who are generally remote from the export houses. Few Indonesian producers have the facilities to carry out their own exporting and the majority of the exporters do not appear to have their own distillation facilities, although some have facilities for filtering and cleaning; there is therefore an active local trading structure, some of the local intermediaries, apart from the exporters themselves, also checking and if necessary, cleaning the oil. The number of active exporters in Indonesia has considerably declined in recent years, mainly the small operators dropping out of the trade. In China, production is carried out under close central surveillance and the right to export is restricted to one or two officially approved bodies, although the former highly-centralised system may have been relaxed somewhat with more autonomy being granted to the individual provinces in certain respects. Elsewhere, for example in Taiwan, Malaysia and Brazil, private enterprise conditions apply but the production base is necessarily small on account of the very low levels of production, and only in Penang, where a certain amount of re-export trade has been evident over the years, are there likely to be several, rather than just one or at most two, exporters.

It has already been mentioned that a considerable proportion of internationally-traded patchouli oil has in the past been marketed via Singapore. The overall role of Singapore as an entrepôt in a whole range of commodities has for some years appeared to be in noticeable steady decline, but it is possible that appreciable quantities of patchouli oil will continue to pass through there for the foreseeable future, since the dealers in Singapore have a reputation for dependability, for a useful service of cleaning, grading and bulking of the oil, and for rapid delivery, direct shipments from Indonesia often taking considerably longer than shipments via Singapore. However, a major reason for Singapore's decline is that an increasing number of compounders prefer to undertake their own cleaning and grading. There used also to be some brokerage trade in patchouli oil in Singapore, involving direct shipment from Medan to destination while the documentation passed through Singapore, but this has very sharply declined.

3.3 VETIVER OIL

A smaller proportion of vetiver oil is produced and marketed under conditions of pure private enterprise than in the case of patchouli oil, primarily because proportionately less of the oil is produced in Indonesia, where conditions of private enterprise widely exist. In Haiti, as well as in China (as discussed in Section 3.2), a centralised system is in operation, although there have recently been some signs of liberalisation. Elsewhere, the small scale of production necessarily implies that only one or two firms or organisations are involved in the trade.

The remarks made about the Indonesian industry under the patchouli oil heading also broadly apply to vetiver oil except that the export trade is conducted from Java where the oil is produced, rather than from Sumatra. However, the importance of Singapore as an entrepôt in trade in vetiver oil, including that of Indonesian origin, is very small in comparison with the patchouli oil trade, although there is no obvious reason why there should be such a contrast between the oils in this respect.

For the most part, it has been concluded that the existing trading patterns and procedures work fairly satisfactorily in relation to the two oils under study. Where adverse criticism was encountered, it mainly concerned the over-rigid trading practices encountered in certain producing countries where strong centralised control had existed, but there are signs that some of these practices are being relaxed as part of general liberalisation policies.

Appendices

APPENDIX 1: STATISTICAL TABLES

Table 1

Patchouli oil: exports from Indonesia, 1975–79

		1975	1976	1977	1978	1979
TOTAL	tonnes	*520*	*431*	*368*	*534*	*383*
	US $'000	*1 551*	*2 255*	*1 521*	*3 417*	*3 239*
	£'000	*698*	*1 249*	*872*	*1 780*	*1 527*
of which to:						
Singapore	tonnes	71	73	80	121	99
	US $'000	172	292	394	789	417
Malaysia	tonnes	117	14	20	9	8
	US $'000	176	11	27	14	22
Japan	tonnes	–	2	–	1	1
	US $'000	–	12	3	4	7
India	tonnes	–	1	1	–	–
	US $'000	–	13	17	–	–
USA	tonnes	158	129	126	221	134
	US $'000	642	857	443	1 372	1 522
United Kingdom	tonnes	57	66	44	43	25
	US $'000	157	254	147	178	282
France	tonnes	55	50	39	44	44
	US $'000	202	343	271	304	394
Germany, Federal Republic of	tonnes	20	35	13	31	11
	US $'000	55	263	74	237	120
Netherlands	tonnes	29	51	32	42	47
	US $'000	88	198	87	232	329
Switzerland	tonnes	–	–	2	18	9
	US $'000	–	–	10	270	126
Spain	tonnes	7	9	11	3	3
	US $'000	41	10	46	11	17
Other countries	tonnes	6	–	1	–	1
	US $'000	19	1	4	6	2

Source: Trade Returns (*Biro Pusat Statistik Djakarta*)

Note: Values are given f.o.b.

Table 2

Patchouli oil: exports and re-exports from Singapore*, 1969–79

		1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
TOTAL	tonnes	*116*	*139*	*120*	*166*	*190*	*95*	*73*	*203*	*175*	*191*	*172*
	£'000	*198*	*275*	*279*	*450*	*515*	*333*	*165*	*583*	*699*	*690*	*635*
of which to:												
USA	tonnes	4	15	17	29	17	10	3	–	5	3	7
	£'000	...	32	51	84	65	48	11	–	9	13	30
United Kingdom	tonnes	19	17	11	15	9	2	2	23	18	33	25
	£'000	44	39	24	38	44	11	11	120	106	184	142
France	tonnes	10	29	15	12	19	15	16	47	37	39	34
	£'000	19	62	35	39	46	43	37	221	217	139	165
Germany, Federal Republic of	tonnes	3	3	12	7	4	2	1	1	5	5	2
	£'000	3	5	25	15	13	10	6	6	19	51	4
Netherlands	tonnes	2	5	5	7	1	2	1	5	7	2	1
	£'000	2	6	15	20	1	16	2	36	75	5	9
Switzerland	tonnes	–	–	5	9	3	8	2	4	8	3	1
	£'000	–	–	16	26	51	44	7	8	17	4	1
Malaysia	tonnes	68	52	23	44	67	17	16	58	18	12	22
	£'000	107	88	46	124	154	62	39	26	35	40	63
Japan	tonnes	3	14	21	15	21	13	3	12	7	17	5
	£'000	7	32	41	39	56	39	10	44	26	81	68
India	tonnes	1	1	5	12	2	19	26	47	68	57	51
	£'000	2	1	6	14	45	28	38	99	145	107	103
Pakistan	tonnes	–	1	–	–	1	1	2	1	3	4	–
	£'000	1	1	–	1	2	3	2	2	5	7	–
Poland	tonnes	–	–	–	–	–	–	–	–	–	7	5
	£'000	–	–	–	–	–	–	–	–	–	13	9
Other countries	tonnes	6	3	7	8	8	7	1	6	6	10	10
	£'000	13	9	20	50	38	29	2	21	45	46	41

Source: *Singapore Half-yearly Trade Statistics,* Department of Statistics

Note* Reference should be made to the text with regard to discrepancies between import and export statistics

Table 3

Patchouli oil: exports from Malaysia, 1973-77

		1973	1974	1975	1976	1977
TOTALS	tonnes	*146*	*75*	*37*	*151*	*32*
	£'000	*710*	*367*	*100*	*634*	*238*
of which to:						
Singapore	tonnes	–	–	10	27	–
	£'000	–	–	19	45	–
India	tonnes	30	13	1	1	1
	£'000	80	45	2	4	4
USA	tonnes	44	28	11	34	1
	£'000	228	160	34	121	5
United Kingdom	tonnes	29	3	3	19	1
	£'000	180	16	12	113	8
France	tonnes	21	8	2	22	13
	£'000	127	53	9	113	125
Germany, Federal Republic of	tonnes	–	–	1	2	4
	£'000	–	1	3	10	33
Netherlands	tonnes	6	10	3	27	–
	£'000	38	45	6	126	2
Switzerland	tonnes	–	–	–	8	1
	£'000	–	–	–	48	10
Italy	tonnes	4	3	1	1	1
	£'000	13	11	3	5	7
Japan	tonnes	9	6	3	6	7
	£'000	33	25	7	26	29
Other countries	tonnes	3	4	2	4	3
	£'000	12	11	6	21	14

Source: *External Trade Statistics,*
Department of Statistics, Malaysia

Table 4

Patchouli oil: imports into the USA, 1970–80

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
TOTALS	tonnes	*143*	*85*	*173*	*307*	*311*	*145*	*218*	*162*	*231*	*238*	*282*
	US $'000	*564*	*474*	*1 770*	*4 551*	*4 648*	*1 181*	*2 547*	*2 410*	*4 006*	*5 857*	*9 767*
	£'000	*235*	*195*	*707*	*1 856*	*1 987*	*532*	*1 410*	*1 381*	*2 087*	*2 761*	*4 199*
of which from:												
Indonesia	tonnes	135	83	168	296	295	134	195	138	223	232	227
	£'000	500	447	1 690	4 352	4 361	1 062	2 220	2 144	3 739	5 623	7 844
Singapore*	tonnes	1	1	1	5	5	–	4	2	2	–	–
	£'000	7	8	8	76	91	–	51	36	44	1	–
Malaysia	tonnes	–	–	1	–	–	–	9	1	1	–	–
	£'000	–	–	3	–	–	–	112	19	10	–	–
China	tonnes	–	–	–	2	–	–	–	–	–	–	49
	£'000	–	–	–	21	–	–	–	–	–	–	1 652
Taiwan	tonnes	–	1	–	–	–	–	–	–	–	–	–
	£'000	–	7	2	–	–	–	–	–	–	–	–
United Kingdom	tonnes	–	–	–	–	–	–	–	5	–	–	–
	£'000	–	–	–	1	–	–	–	5	–	–	3
France	tonnes	4	–	3	2	5	–	9	7	5	4	3
	£'000	38	8	52	53	95	–	145	159	207	144	164
Germany, Federal Republic of	tonnes	–	–	–	–	–	–	–	4	–	–	–
	£'000	–	4	–	–	–	–	–	19	–	–	1
Netherlands	tonnes	3	–	1	–	–	–	1	–	–	–	2
	£'000	13	–	15	–	–	–	10	–	1	20	83
Switzerland	tonnes	–	–	–	2	–	–	–	–	–	1	–
	£'000	–	–	–	29	–	–	4	1	2	31	2
Other countries and territories	tonnes	–	–	–	1	6	11	–	6	–	1	1
	£'000	6	–	–	18	101	120	4	26	2	38	19

Source: US Trade Returns

Note: *Reference should be made to the text with regard to discrepancies between import and export statistics

Table 5

Patchouli oil: imports into Japan, 1976–80

		1976	1977	1978	1979	1980
TOTAL	tonnes	*31*	*26*	*32*	*42*	*31*
	£'000	*255*	*287*	*347*	*489*	*509*
of which from:						
Indonesia	tonnes	16	15	15	20	18
	£'000	97	124	130	204	239
Singapore*	tonnes	4	1	3	5	1
	£'000	33	6	26	45	19
Malaysia	tonnes	2	2	2	1	–
	£'000	9	12	11	4	–
China	tonnes	3	3	1	4	4
	£'000	15	30	9	54	60
France	tonnes	6	6	8	10	6
	£'000	92	111	143	150	130
Netherlands	tonnes	1	–	1	–	–
	£'000	6	2	16	1	2
USA	tonnes	–	–	1	2	3
	£'000	2	2	12	30	59
Other countries	tonnes	–	–	–	–	–
	£'000	1	–	–	1	1

Source: *Japan Exports and Imports,* Japanese Tariff Association

Note: *Reference should be made to the text with regard to discrepancies between export and import statistics

Table 6

Patchouli oil: forward prices in the United Kingdom, 1974–81

c.i.f., £ per kg

		1st quarter	2nd quarter	3rd quarter	4th quarter	Annual range: Low	High
Indonesian (prices for 1976–80 are shipment)	1975	6.60	4.00	4.00	4.15	4.00	6.60
	1976	4.53	5.00	5.00	8.25	4.30	8.25
	1977	9.90	10.10	11.60	12.20	9.90	12.20
	1978	10.20	10.50	10.30	10.30	9.90	10.80
	1979	10.10	9.56	9.56	17.00	9.56	17.00
	1980	17.00	21.00	19.00	13.00	12.00	21.00
	1981	13.50	16.50	16.50		12.00	16.50
Chinese*	1977	8.00	10.30	11.38	11.32	8.00	11.50
	1978	11.40	11.43	10.87	9.77	9.60	11.50
	1979	9.50	6.00	16.35	16.30	9.00	16.60
	1980	16.22	16.28	15.57	15.50	15.50	17.20
	1981	12.63	13.05	15.25	15.37	12.00	15.45
ex-Singapore (standard quality)	1974	N.Q†	N.Q†	10.86	9.60	7.50	12.00
	1975	9.60	9.60	4.95	4.95	4.95	9.60
	1976	4.95	4.95	4.95	7.50	4.95	7.50
	1977	8.33	9.33	11.00	10.90	8.00	11.50
	1978	10.07	10.33	10.42	9.65	9.45	11.00
	1979	9.50	10.83	13.17	19.60	9.50	20.85
	1980	19.53	19.15	17.08	14.15	14.10	20.85
	1981	12.08	13.17	16.05	17.28	11.75	17.35

Sources: Indonesian: *Cosmetic World News*
Chinese: *Public Ledger*
Singapore: *Cosmetic World News* (1974–76)
Public Ledger (1977–81)

Notes: *The only quoted price prior to 1977 was a solitary quotation of £2.92/kg during the first quarter of 1971
† N.Q=not quoted

Table 7

Vétiver oil: exports from Indonesia, 1975–79

		1975	1976	1977	1978	1979
TOTAL	tonnes	*45*	*92*	*73*	*95*	*105*
	US $'000	*1 166*	*2 703*	*2 393*	*2 520*	*2 566*
	£'000	*525*	*1 497*	*1 371*	*1 313*	*1 210*
of which to:						
Singapore	tonnes	1	2	5	18	8
	£'000	50	34	47	105	41
Japan	tonnes	–	1	2	2	4
	£'000	4	27	52	106	195
USA	tonnes	5	9	17	27	27
	£'000	110	355	710	1 091	819
United Kingdom	tonnes	10	9	4	5	5
	£'000	215	260	183	104	120
France	tonnes	22	54	35	28	31
	£'000	529	1 539	1 061	670	517
Germany, Federal Republic of	tonnes	1	7	3	1	4
	£'000	13	225	105	10	60
Netherlands	tonnes	4	4	4	9	22
	£'000	92	132	174	338	743
Switzerland	tonnes	–	3	1	4	2
	£'000	–	94	57	62	5
Spain	tonnes	2	2	2	1	1
	£'000	102	23	3	22	45
Other countries	tonnes	2	1	–	1	1
	£'000	52	15	2	12	19

Source: Trade Returns (*Biro Pusat Statistik, Djakarta*)

Note: Values are given f.o.b.

Table 8

Vetiver oil: exports from France, 1976–80

		1976	1977	1978	1979	1980
TOTALS:	tonnes	*88*	*69*	*51*	*32*	*43*
	fr.'000	*20 846*	*18 909*	*15 338*	*10 260*	*11 930*
	£'000	*2 415*	*2 205*	*1 771*	*1 137*	*1 242*
of which to:						
USA	tonnes	27	13	10	5	13
	fr.'000	6 794	4 150	3 657	2 040	3 600
United Kingdom	tonnes	7	8	5	4	4
	fr.'000	1 636	2 249	1 593	1 297	1 158
Germany, Federal Republic of	tonnes	6	5	4	4	4
	fr.'000	1 586	1 994	1 527	1 503	1 756
Netherlands	tonnes	7	–	1	1	–
	fr.'000	1 975	58	194	250	90
Switzerland	tonnes	8	4	4	4	2
	fr.'000	2 273	1 416	1 504	1 112	626
Italy	tonnes	...	–	2	1	1
	fr.'000	...	126	546	291	259
Spain	tonnes	4	6	4	3	1
	fr.'000	523	1 276	435	797	241
Soviet Union	tonnes	16	21	13	1	8
	fr.'000	2 642	4 317	2 799	245	1 818
Japan	tonnes	7	7	6	5	4
	fr.'000	1 781	1 770	1 825	1 601	927
Other countries	tonnes	6	5	5	4	6
	fr.'000	1 636	1 553	1 258	1 124	1 455

Source: *Statistiques du Commerce Extérieur de la France,*
Direction Générale des Douanes et Droits Indirects – 1976

Table 9

Vetiver oil: imports into the USA, 1970–80

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
TOTAL	tonnes	*79*	*75*	*90*	*76*	*96*	*76*	*112*	*133*	*154*	*79*	*115*
	US$'000	*1 686*	*1 650*	*1 911*	*1 806*	*5 619*	*3 655*	*5 799*	*7 822*	*10 374*	*4 440*	*4 614*
	£'000	*703*	*678*	*764*	*736*	*2 402*	*1 645*	*3 211*	*4 841*	*5 405*	*2 093*	*1 983*
of which from:												
Haiti	tonnes	54	52	66	53	66	52	74	103	114	38	59
	US$'000	1 100	1 074	1 311	1 163	3 853	2 443	3 790	5 919	7 717	2 477	2 621
Indonesia	tonnes	5	3	3	2	5	3	11	16	27	31	44
	US$'000	78	60	51	26	346	102	424	869	1 481	1 142	1 083
Réunion	tonnes	–	6	3	7	4	2	9	5	2	2	3
	US$'000	–	184	96	179	212	159	569	401	205	214	301
China	tonnes	–	–	–	1	–	–	–	–	–	–	–
	US$'000	–	–	–	15	–	–	1	2	–	14	11
Angola	tonnes	6	2	–	2	3	–	–	1	–	–	–
	US$'000	100	27	3	29	139	–	–	22	–	–	–
Brazil	tonnes	1	–	4	–	–	–	–	–	–	2	–
	US$'000	8	–	80	–	–	–	–	–	12	68	–
India	tonnes	1	2	2	–	–	–	–	–	–	–	–
	US$'000	16	59	48	–	–	–	–	–	39	–	–
South Africa, Republic of	tonnes	–	–	–	–	–	–	–	–	–	1	–
	US$'000	–	9	–	–	–	–	14	–	–	67	23
Guatemala	tonnes	–	2	3	3	–	–	–	–	–	–	–
	US$'000	–	36	53	73	–	–	–	–	–	–	–
France	tonnes	3	6	8	9	15	19	19	9	10	3	9
	US$'000	93	170	248	321	923	933	995	605	863	324	571
Other EC countries	tonnes	–	–	–	–	–	–	0.1	–	0.2	1.0	–
	US$'000	–	–	–	–	–	–	5	–	14	95	–
Other countries	tonnes	11	1	1	–	3	–	–	–	1	1	–
	US$'000	291	31	21	1	146	18	1	4	42	40	4

Source: US Trade Returns

Table 10

Vetiver oil: imports into the United Kingdom, 1976–79

		1976	1977	1978	1979
TOTAL	tonnes	*22*	*25*	*22*	*21*
	£'000	*505*	*781*	*724*	*527*
of which from:					
Indonesia	tonnes	7	7	4	6
	£'000	133	194	112	92
Singapore	tonnes	1	1	4	2
	£'000	14	28	122	69
China	tonnes	2	4	2	1
	£'000	31	98	50	25
Réunion	tonnes	–	1	1	–
	£'000	2	42	45	21
Brazil	tonnes	1	–	–	1
	£'000	22	8	8	31
USA	tonnes	1	3	2	1
	£'000	26	120	88	37
France	tonnes	9	6	7	7
	£'000	231	218	241	212
India	tonnes	–	–	–	2
	£'000	6	–	10	29
Other countries	tonnes	1	2	1	–
	£'000	40	75	47	10

Source: UK Trade Statistics
HM Customs and Excise

Table 11

Vetiver oil: imports into France, 1970–80

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
TOTAL	tonnes	*119*	*78*	*123*	*135*	*99*	*86*	*143*	*118*	*117*	*82*	*86*
	£'000	*933*	*723*	*1 097*	*1 439*	*2 701*	*1 641*	*4 256*	*4 232*	*4 193*	*2 439*	*2 059*
of which from:												
Indonesia	tonnes	21	19	30	21	14	19	43	38	35	27	40
	£'000	151	140	218	207	333	338	1 017	1 219	1 055	514	568
Réunion	tonnes	22	18	20	25	15	7	19	14	13	11	8
	£'000	272	230	274	408	403	236	703	571	600	564	425
Haiti	tonnes	48	31	57	66	55	47	76	49	57	34	33
	£'000	423	275	489	637	1 563	932	2 373	1 852	2 079	1 109	929
Angola	tonnes	4	5	5	14	7	...	...	–	–	–	–
	£'000	29	34	36	115	136	...	...	–	–	–	–
Brazil	tonnes	2	4	4	1	2	...	...	–	1	1	–
	£'000	18	33	29	10	65	...	...	17	27	28	6
China	tonnes	9	...	...	4	4	...	3	5	1	4	–
	£'000	6	...	...	33	106	...	51	147	38	31	4
Singapore	tonnes	1	...	...	...	...	...	...	1	1	1	2
	£'000	6	...	...	...	...	...	...	50	20	13	30
USA	tonnes	1	1	4	4	1	2	2	9	8	4	2
	£'000	9	10	28	24	39	54	68	340	296	127	49
Other countries	tonnes	11	–	3	2	2	11	–	2	3	2	2
	£'000	20	2	22	5	57	31	44	36	78	53	47

Sources: *Statistiques du Commerce Extérieur,*
Direction Générale de Douanes et Droits Indirects
(From 1973) *Nimexe Analytical Tables,*
Statistical Offices of the European Communities

Table 12

Vetiver oil: imports into the Federal Republic of Germany, 1973–79

		1973	1974	1975	1976	1977	1978	1979
TOTAL	tonnes	*9*	*7*	*5*	*7*	*7*	*5*	*7*
	£'000	*127*	*187*	*159*	*220*	*282*	*227*	*272*
of which from:								
Haiti	tonnes	–	–	–	2	–	1	1
	£'000	...	...	...	71	...	33	33
Indonesia	tonnes	–	–	–	...	1	...	–
	£'000	...	...	...	...	44	...	...
Singapore	tonnes	–	–	–	...	–	...	2
	£'000	...	...	...	...	...	...	36
Angola	tonnes	–	1	–	...	–	...	–
	£'000	...	26	...	...	...	...	...
USA	tonnes	3	1	1	...	–	...	–
	£'000	35	23	32	...	...	...	...
France	tonnes	6	4	3	4	5	3	4
	£'000	88	111	119	121	225	167	201
Other EC countries	tonnes	–	1	–	–	–	–	–
	£'000	1	14	4	6	1	1	–
Other countries	tonnes	–	1	–	1	–	1	–
	£'000	3	14	4	22	11	25	2

Source: *Aussenhandel nach Waren und Ländern,*
Statistisches Bundesamt
Wiesbaden

Table 13

Vetiver oil: imports into the Netherlands, 1975–79

		1975	1976	1977	1978	1979
TOTAL	tonnes	*2*	*8*	*77*	*5*	*4*
	£'000	*56*	*212*	*273*	*203*	*123*
of which from:						
Indonesia	tonnes	–	–	–	–	–
	£'000	7	9	–	5	1
USA	tonnes	2	4	7	5	4
	£'000	38	112	262	186	112
France	tonnes	–	4	–	–	–
	£'000	10	92	–	10	7
Other countries	tonnes	–	–	–	–	–
	£'000	–	–	11	1	2

Source: *Maandstatistiek van de buitenlands handel per goederensoort*
Centraal bureau voor de statistiek

Table 14

Vetiver oil: imports into Japan, 1976–80

		1976	1977	1978	1979	1980
TOTAL	tonnes	*8*	*10*	*11*	*15*	*9*
	£'000	*246*	*358*	*405*	*425*	*233*
of which from:						
Indonesia	tonnes	1	2	4	6	4
	£'000	24	61	119	122	57
Haiti	tonnes	–	–	1	1	1
	£'000	–	16	37	33	13
USA	tonnes	–	–	–	1	1
	£'000	1	15	–	50	10
France	tonnes	7	7	6	5	4
	£'000	219	265	243	188	142
Other countries	tonnes	–	–	–	1	–
	£'000	1	1	6	30	11

Source: *Japan Exports and Imports,* Japan Tariff Association

Table 15

Vetiver oil: prices in New York (US $) and London (£ sterling), 1974–81

		1st quarter	2nd quarter	3rd quarter	4th quarter	Annual range: Low	High
Bourbon	1974	49.59	49.59	49.59	N.Q.*	49.59	49.59
(US $ per kg, f.o.b.)	1975	N.Q.*	101.38	90.03	80.17	79.34	101.38
	1976	78.06	75.38	77.14	77.14	77.14	84.85
	1977	79.14	89.50	108.00	110.00	74.14	125.53
	1978	110.55	92.36	103.59	103.59	96.98	124.53
	1979	84.85	66.12	66.12	83.02	66.12	116.81
	1980	116.81	116.81	125.63	143.26	116.81	143.26
	1981	124.01	132.28	104.72	104.72	99.20	143.30
Haitian	1974	28.65	28.65	30.86	33.06	26.45	33.06
(US $ per kg, f.o.b.)	1975	33.06	51.57	53.12	48.49	33.06	57.30
	1976	49.04	N.Q.*	58.77	59.51	47.39	59.51
	1977	59.51	66.85	70.53	72.55	59.51	76.04
	1978	74.05	74.39	74.39	74.59	72.73	76.04
	1979	72.75	74.41	74.41	73.30	66.13	73.85
	1980	65.39	54.00	54.00	54.00	44.08	63.92
	1981	49.60	53.57	40.79	40.79	39.68	63.93
Indonesian	1974	N.Q.*	N.Q.*	N.Q.*	59.00[a]	30.00	60.00
(£ sterling per kg, shipment)	1975	27.67	20.10	17.90[a]	15.90[a]	15.90	26.50
	1976	17.43	20.50	20.50[b]	25.00[a]	15.90	28.00
	1977	28.00	36.00[b]	39.00[b]	39.00[b]	28.00	39.00
	1978	36.00	33.50	33.50[b]	31.83	31.00	34.50
	1979	25.11[a]	18.63[a]	18.63[b]	16.50[a]	16.50	31.60
	1980	16.50[a]	14.75[b]	12.00[b]	11.50[a]	11.00	16.50
	1981	11.33[a]	12.00[a]	12.00[a]			

Source: *Chemical Marketing Reporter* (US prices)
Cosmetic World News (UK prices)

Notes: *N.Q. = Not quoted
(a) Based on two months
(b) Based on one month

APPENDIX 2: STANDARD SPECIFICATIONS FOR THE OILS OF PATCHOULI AND VETIVER

Oil of patchouli

Standard specifications have been published by several organisations, including the Essential Oils Association of the USA (EOA No. 23), the British Standards Institution (BS 2999/10: 1965) and the International Organization for Standardization (ISO: 3757: 1978). The main physico-chemical property requirements of these three standards are summarised. Interested readers should obtain copies of these standards for information on the complete requirements of the specifications (appearance, odour, etc.) and the methods of analysis.

The main physicochemical requirements of the EOA and ISO standards apply to oils from all origins:

	EOA No. 23	*ISO 3757: 1978*
Relative density at 20/20° C:	—	0.955 to 0.983
Specific gravity at 25/25° C:	0.950 to 0.975	—
Optical rotation at 20° C:	-48° to -65°	-40° to -66°
Refractive index at 20° C:	1.5070 to 1.5150	1.5050 to 1.5120
Saponification value:	Not more than 20	—
Ester value:	—	10, maximum
Acid value:	Not more than 5	4, maximum
Solubility in ethanol (90%, v/v) at 20° C:	1 in 10 volumes	1 in 10 volumes

The British Standard specification lays down some additional requirements to distinguish oils of different origins:

	BS 2999/10: 1965
Apparent density at 20° C:	0.952 to 0.980
Optical rotation at 20° C	
East Indies:	-47° to -66°
Africa:	-40° to -68°
Seychelles:	-40° to -68°
Unspecified origin:	-40° to -68°
Refractive index at 20° C:	1.505 to 1.512
Ester value:	10, maximum
Acid value:	4, maximum
Solubility in ethanol (90%, v/v) at 20° C:	1 in 10 volumes

Oil of vetiver

Standard specifications have been published by several organisations and a draft specification is under consideration by the International Organization for Standardization.

The main physicochemical requirements of the standards of the Essential Oils Association of the USA (EOA No. 24) and of the British Standards Institution (BS 2999/15: 1965) are summarised on p.50. Interested readers should obtain copies of these standards for information on their complete requirements (appearance, odour, etc.) and the methods of analysis. The EOA standard applies to oils from all sources, while the British Standard distinguishes between different supply sources.

	EOA No. 24	*BS 2999/15: 1965*
Specific gravity at 25°/25°C:	0.984 to 1.035	–
Apparent density at 20°C:	–	0.984 to 1.019
Optical rotation at 20°C:	+15° to +45°	India: +10° to +25° Réunion: +14° to +25° Haiti: +20° to +40° Java: +17° to +46° Unspecified: + 10° to +46°
Saponification value:	14 to 45	–
Ester value:	–	2 to 32
Ester value after acetylation:	110 to 165	Not less than 150
Solubility in ethanol (80%, v/v) at 20°C:	1 in 3 volumes	1 in 3 volumes

APPENDIX 3: FIRMS IN THE ESSENTIAL OILS TRADE (in the markets surveyed)

The following list is not intended to be exhaustive and the inclusion of a firm's name implies no knowledge on the Institute's part of the financial standing of the firm concerned.

USA

Biddle Sawyer Corporation 2 Penn Plaza New York NY 10001	Dealer
Bush Boake Allen Inc 475 Walnut Street Norwood NJ 07648	Processors/compounders
L. A. Champon and Co Inc 70 Hudson Street Hoboken NJ 07030	Agents/brokers
Citrus and Allied Essences 65 S Tyson Avenue Floral Park NY 11001	Processors/compounders
Crompton and Knowles Corporation 17–01 Nevins Road Fair Lawn NJ 07410	Compounders
Colgate-Palmolive Co 300 Park Avenue New York NY 10022	End-users
Firmenich Inc PO Box 5880 Princeton NJ 08540	Processors and compounders
Felton International Inc 599 Johnson Avenue Brooklyn NY 11237	Flavour house

Fritzsche Dodge and Olcott Inc 76 Ninth Avenue New York NY 10011	Processors/manufacturers
Givaudan Corporation 100 Delawanna Avenue Clifton NJ 07014	Processors/compounders
Haarmann and Reimer Corporation PO Box 175 Springfield NJ 07081	Processors/compounders
D. W. Hutchinson and Co 700 South Columbus Avenue Mount Vernon NY 10550	Dealer
International Flavours and Fragrances (US) 600 State Highway 36 Hazlet NJ 07730	Processors/compounders
Ivolin Enterprises 500 Fifth Avenue Suite 4330 New York NY 10036	Dealer
Kalsec Inc PO Box 511 Kalamazoo MI 49005	Flavour house
Lautier Aromatiques 5 Pearl Court Allendale NJ 07401	Processors and importers
Lever Brothers Co 390 Park Avenue New York NY 10022	End-users
Ludwig Mueller Co Inc 2 Park Avenue New York NY 10016	Brokers
J. Manheimer Inc 47–22 Pearson Place Long Island City NY 11101	Dealer
Naarden International USA Inc 43–23 37th Avenue Long Island City NY 11101	Processors/compounders

Norda Inc 140 Route 10 East Hanover NJ 07936	Processors/compounders
Polak's Frutal Works Inc Middletown NY 10940	Processors/compounders
Polarome International Inc 22 Ericsson Place New York	Dealer
SCM Organic Chemicals Clark Road PO Box 389 Jacksonville FL 32201	Manufacturers of synthetic perfumery and flavouring materials
E. L. Scott and Co Inc 1 World Trade Centre Suite 2347 New York NY 10048	Agents
George Uhe Co Inc 76 Ninth Avenue New York NY 10011	Broker
Ungerer and Company 4 Bridgewater Lane PO Box U Lincoln Park NJ 07035	Processors/manufacturers
Union Camp Corporation PO Box 60369 Jacksonville FL 32205	Manufacturers of aromatic products
The John D. Walsh Co 65 Glen Avenue Glen Rock NJ 07452	Broker
Takasago USA Inc Volvo Drive Rockleigh NJ 07647	Processors/manufacturers
A. M. Todd Company Kalamazoo MI 49005	Dealer

United Kingdom

Bush Boake Allen Ltd Blackhorse Lane London E17 5QP	Processors/compounders

H. E. Daniel Ltd Longfield Road Tunbridge Wells Kent	Dealers, processors, compounders
Dragoco (GB) Ltd Lady Lane Industrial Estate Hadleigh Ipswich Suffolk IP7 6AX	Processors/dealers
T. M. Duche and Sons (UK) Ltd Berisford House 50 Mark Lane London EC3R 7QS	Dealers/merchants
S. Figgis and Co Ltd 53 Aldgate High Street London EC3N 1LU	Brokers
Food Industries Ltd Dock Road South Bromborough Port The Wirral Merseyside	End-users, flavour and feedstuff manufacturers
Fuerst Day Lawson Ltd 1 Leadenhall Street London EC3V 1JH	Dealers
Lionel Hitchen Ltd 50 Albert Road North Reigate Surrey	Processors/compounders
International Flavours and Fragrances (GB) Ltd Crown Road Southbury Road Enfield Middlesex EN1 1TX	Processors/compounders
Proprietary Perfumes Ltd Ashford Kent	Processors/compounders
R. Sarant and Co Ltd Priestley Road Basingstoke Hants RG24 9PU	Dealers/compounders
R. C. Treatt and Co Ltd Northern Way Bury St. Edmunds Suffolk	Dealers

Ungerer and Co Ltd Flint Road Letchworth Hertfordshire SG6 1HJ	Compounders
A. E. Wells and Co (Produce) Ltd 500 Old Kent Road London SE1 5AH	Dealers
White Stevenson Ltd Albert Road North Reigate Surrey	Manufacturers of flavouring essences
Zimmermann Hobbs Ltd Dawson Road Bletchley Milton Keynes Bucks MK1 1JR	Compounders

France

Adrian SA 15 rue de Cassis 13008 Marseille	Dealers
Benard et Honnorat SA BP 67 06332 Grasse	Processors/compounders
Madame Boyer 62 rue Lafayette 75009 Paris	Broker
Pierre Chauvet SA 83770 Seillans	Essence manufacturers
Les Fils et Petits-Fils de Maurice Duclos 8 Place Vendôme 75001 Paris	Brokers
Lautier Fils 06 Grasse	Processors/compounders
V. Mane Fils 06620 Bar-sur-Loup	Processors/compounders
Naarden International (France) SA 06 Grasse	Processors/compounders
Syndicat National des Fabricants de Produits Aromatiques ('Prodarom') 7 rue Gazan 06 Grasse	Trade association
P. Robertet et Co Avenue Sidi-Brahim 06333 Grasse	Processors/compounders

Roure Bertrand Dupont SA 27 av. Pierre-Sémard 06130 Grasse	Processors/compounders
Schmoller et Bompard Chemin de la Madeleine 06331 Grasse	Processors/compounders

The Federal Republic of Germany

Cornehls und Bosse bei den Mühren 91 2000 Hamburg 11	Brokers
Dragoco GmbH D-3450 Holzminden	Processors/compounders
Herrmann Düllberg Alsterdorferstrasse 19 D-2000 Hamburg	Essential oil manufacturers
Frey und Lau Behringstrasse 116 D-2000 Hamburg 50	Essential oil manufacturers
Haarmann und Reimer GmbH D-3450 Holzminden	Processors/compounders
Paul Kaders GmbH Schauenburgerstrasse 21 2000 Hamburg 1	Dealers
C. Melchers and Co 48a Steindamm D-2820 Bremen 77	Dealers
Worlee-Drogen Bellevue 7–8 2000 Hamburg 60	Dealers

The Netherlands

International Flavours and Fragrances (Nederland) bv Zevenheuvelenweg 60 5048 AN Tilburg	Processors/compounders
Maschmeijer Aromatics PO Box 4170 Omval 81 1009 AD Amsterdam	Processors/compounders
Mirandolle, Voute and Co bv Maasstraat 12a–14a 3016 DC Rotterdam	Dealers/agents
Naarden International PO Box 2 1400 CA Naarden-Bussum	Processors/compounders

Polaks Frutal Works Nijverheidsweg Zuid 7 Amersfoort	Processors/compounders
A. Valenkamp bv Prins Hendrikkade 152 1011 AW Amsterdam	Broker
Switzerland	
Jules Chiquet SA Dreispitzstrasse 11 Bau 181 4142 Basle	Dealer
Firmenich SA CH-1211 Geneva 8	Processors/compounders
Givaudan SA CH-1214 Vernier-Geneva	Processors/compounders
Puressence Zürich Blümlisalpstrasse 3 8033 Zürich	Dealer

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