

# TURMERIC

## Introduction

Turmeric (*Curcuma longa*) is a very important spice in India, which produces nearly the whole world's crop and uses 80 per cent of it. Turmeric forms part of most Indian curry powders. It is a natural antiseptic. The spice is sometimes also called the 'Indian saffron' thanks to its brilliant yellow colour. Turmeric comes from the root of *curcuma longa*, a leafy plant of the ginger family. The plant is an herbaceous perennial, 60-90 cm high, with a short stem and tufted leaf. The root, or rhizome, has a tough brown skin and bright orange flesh. In fresh state, the rootstock has an aromatic and spicy fragrance, which on drying gives way to a



more medicinal aroma.

## Varieties:

Turmeric belongs to the group curcuma and there are 30 varieties included in it 'Alleppey Finger', 'Erode and Salem turmeric', 'Rajapuri' and 'Sangli turmeric', 'Nizamabad fingers' are some popular varieties of India. Rajapuri and Salem varieties are considered to be the best in terms of quality amongst all the varieties. The varieties are given their names after the areas producing them.

## AGRONOMY:

### Cultivation

Turmeric can be cultivated in diverse tropical and sub-tropical conditions, to up to 1,500 metres from the sea level, with temperatures varying from 20-40°C, and rainfall above 1500 mm. It is a nine-month crop sown in July and harvested in April. Turmeric thrives in well-drained, fertile, sandy and clayey, black, red or alluvial loams, rich in humus and uniform in texture. Rich loamy soils having natural drainage and irrigation facilities are the best. Turmeric cannot stand water stagnation or alkalinity.

### Harvesting and Curing

The crops are ready for harvest in seven to nine months depending upon the time of sowing. The harvest is carried out during January to March. The aromatica types mature in about 7 months and the longa types in about 9 months and the intermediate types in about 8 months. The Marketing season is from February to May. The leaves of the crop turns dry and are light brown and yellowish in colour on maturity. Height of the crop around 1.5 feet after the complete growth with maximum 8-10 branches with cracks developed on the soil signifies good yield of turmeric. The land is ploughed and the rhizomes are carefully lifted with a spade. Harvested rhizomes are cleaned of mud and other extraneous matter adhering to them. The green rhizomes are boiled in water, which are then spread out on a clean floor and allowed to dry in the sun for about 10-15 days. They are stirred 3-4 times to ensure uniform drying. The rounds and fingers are dried separately. The former takes more time to dry. When fully dried, turmeric becomes hard and stiff. The dried turmeric is rubbed against the hard surface of the drying-floor or trampled under feet covered with pieces of gunny cloth and the scales and root bases are separated by winnowing. Rhizomes for seed are generally heaped in the shade of trees or in well-ventilated sheds and covered with turmeric leaves.

### State wise harvest chart

Indian Scenario												
States	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tamil Nadu												
Andhra Pradesh												
Maharashtra												
Karnataka												

## Quality requirements

The quality of cured turmeric is assessed on the basis of several factors, which include the pigment (curcumin) content, the general appearance, size and shape of the rhizome. The relative importance of these various quality attributes is dependent upon the intended end-use of the product. In the UK and the US, most consumers prefer turmeric in the form of polished fingers for spice applications. The chief factors of good quality in finger turmeric are a high content of pigment, giving a deep, yellow colour, and low 'bitter-principle' content. When used as a spice or condiment, the aroma and flavour imparted by the volatile oil are important. The aroma should have a musky, pepper-like character and the flavour should be slightly aromatic and somewhat bitter. When the turmeric is intended for use specifically as a colouring agent, either in the powdered form or as an oleoresin extract, the general appearance and physical form of the whole rhizome is less important. In this case, very high curcumin content is essential and low volatile oil content is desirable. Bulbs, splits and old rhizomes are often suitable for this purpose.

## Uses

Turmeric is used to flavour and colour foodstuffs. It is a principal ingredient in curry powder. Turmeric oleoresin is used in brine pickles and to some extent in mayonnaise and relish formulations, non-alcoholic beverages, gelatins, butter and cheese, etc. The colour curcumin extracted from turmeric is used as a colorant. Turmeric is also used as a dye in textile industry. It is used in the preparation of medicinal oils, ointments and poultice. It is stomachic, carminative, tonic, blood purifier and an antiseptic. It is used in cosmetics. The aqueous extracts have biopesticidal properties.

## Indian Scenario

India is the largest producer, consumer and exporter of turmeric in the world. The country consumes most (80 per cent) of its turmeric production and it exports the surplus. Turmeric is grown in as many as 25 states of India with Andhra Pradesh, Tamilnadu, Karnataka and Orissa being the leading producers. Other main producers of turmeric are Gujarat, West Bengal, Assam, Meghalaya and Maharashtra. India has nearly 1.73 lakh hectares under turmeric cultivation with a total production of 8.55 lakh tonnes during the year. Andhra Pradesh topped both in area and production during the year 2005-06 with 69990 hectares (40.46 per cent) and 518550 tonnes (60.60 per cent), respectively. Tamil Nadu followed with acreage of 25970 hectares (15.01 per cent) and production of 143358 tonnes (16.75 per cent).

### Indian production of Turmeric

Year	Area (Ha)	Production (MT)
1997-98	139,700	549,200
1998-99	160,700	597,900
1999-00	161,300	653,600
2000-01	187,431	719,609

2001-02	162,950	552,300
2002-03	149,710	525,740
2003-04	150,730	565,470
2004-05	158,060	715,360
2005-06	173,005	855,763

Source: Spices Board of India (latest available as of Feb 2008)

### Statewise Production of Turmeric (2005-06 p )

State	AREA		PRODUCTION	
	Area (Ha)	%Share	Production (MT)	%Share
<b>Andhra Pradesh</b>	69,990	40.46	518,550	60.60
<b>Tamil Nadu</b>	25,970	15.01	143,358	16.75
<b>Orissa</b>	24,020	13.88	57,090	6.67
<b>West Bengal</b>	11,844	6.85	25,049	2.93
<b>Gujarat</b>	1,400	0.81	16,510	1.93
<b>Karnataka</b>	5,410	3.13	26,380	3.08
<b>Maharashtra</b>	6,760	3.91	8,427	0.98
<b>Assam</b>	11,700	6.76	8,400	0.98
<b>Others</b>	15,911	9.20	51,999	6.08
<b>TOTAL</b>	<b>173,005</b>	<b>100.00</b>	<b>855,763</b>	<b>100.00</b>

Source: Spices Board of India (latest available as of Feb 2008)

### International Scenario

Currently, India is the major producer and consumer of turmeric. China is second largest supplier of the spice and it is followed by a number of other countries in the Indian sub-continent, Southeast Asia, the Caribbean and Latin America. None of these are of significance as oleoresin suppliers. Other producers in Asia include Bangladesh, Pakistan, Sri Lanka, Taiwan, China, Burma (Myanmar), and Indonesia. Turmeric is also produced in the Caribbean and Latin America: Jamaica, Haiti, Costa Rica, Peru, and Brazil. The use of the spice spread widely in Oceania, but it is not used as a condiment in Melanesia and Polynesia.

There are two dominant types of turmeric in the world market: 'Madras', and 'Alleppey', both named after the regions of production in India. The orange-yellow flesh Alleppey turmeric is predominantly imported by the US, where users prefer it as a spice and a food colorant. Alleppey turmeric contains about 3.5-5.5 per cent volatile oils, and 4-7 per cent curcumin. In contrast, the Madras type contains only 2 per cent of volatile oils and 2 per cent of curcumin. The Madras turmeric is preferred by the British and Middle Eastern markets, for it is intense, brighter and lighter yellow colour, better suited for mustard paste and curry powder or paste used in oriental dishes. Turmeric produced in the Caribbean, Central and South America has low curcumin and volatile oil contents, and is darker and is not desired by the US importers. The Bengal type is preferred for use in dyes in India. It is interesting to note that in the US, turmeric is considered as a spice by the food industry, whereas the FDA classifies it as a food colorant. The major producer, India, exports to the most of the consumers. UAE, US, Bangladesh, Japan, Sri Lanka, Malaysia and UK, together account for about 65 per cent of Indian turmeric exports.

## Exports

India accounts for about 80 per cent of world turmeric production and 60 per cent of world exports. Some of the important turmeric varieties exported from India are: Allepey Finger Turmeric, Rajapuri, Madras and Erode varieties. The processed forms of turmeric exported are dry turmeric, fresh turmeric, turmeric powder and oleoresin. United Arab Emirates is a major importer, accounting for 18.35 per cent of the total exports followed by the US with 11.44 per cent. The other leading importers are Japan, the UK and Sri Lanka. The quality stipulation followed by the US is considered to be more important for export of turmeric.

### Indian Exports of Turmeric

Year	Quantity (MT)	Value (Rs Lakhs)
1996-97	23,019	5,844
1997-98	28,875	8,306
1998-99	37,297	12,914
1999-00	37,776	12,351
2000-01	44,627	11,557
2001-02	37,778	9,073
2002-03	32,402	10,337
2003-04	37,044	13,111
2004-05	43,097	15,625
2005-06	46,405	15,286
2006-07	51,500	16,480

Source: Spice Board of India (latest available as of Feb 2008)

### Indian Exports of Turmeric to Different Countries

Country	Quantity (MT)	Value (Rs Lakhs)	% Share
U.A.E	5,020.75	1,511.62	18.35
U.S.A	3,128.99	1,039.31	11.44
Bangladesh	2,807.01	614.41	10.26
Japan	2,373.99	1,104.27	8.68
Sri Lanka	1,611.02	351.01	5.89
Malaysia	1,555.86	680.12	5.68
U.K	1,491.42	634.68	5.45
South Africa	984.03	413.94	3.59
Netherlands	900.05	360.62	3.29
Saudi Arabia	735.02	235.06	2.68
Morocco	597.24	179.55	2.18
Egypt (A.R.E)	543.64	233.06	1.98
Others	5,610.00	2,230.43	20.51
Total	27,359.13	9,588.08	100.00

Source: indiaagristat.com

Asian countries consume much of their own turmeric production, except for Japan and Sri Lanka. Major importers are the Middle East and North African countries, Iran, Japan and Sri Lanka. These importing countries represent 75 per cent of the world turmeric trade, which is met mostly by the Asian producing countries. Europe and North America represent the remaining 15 per cent and are supplied by India and Central and Latin American countries. Taiwan exports mostly to Japan. About 97 per cent of US imports of turmeric come from India, with the islands of the Pacific and Thailand supplying the rest. The increasing demand for natural products as food additives makes turmeric an ideal candidate as a food colorant, thus increasing demand for it. Additionally, recent medical research demonstrating the anti-cancer and anti-viral activities of turmeric may also increase its demand in Western countries.

### Outlook

Demand for turmeric in developed countries is likely to grow only modestly. By contrast, a continual increase in consumption is expected in Asia. This could lead to shortages, particularly of high quality material. While many countries have the potential to expand production to meet any emergent supply gap, the present quality of their products is very mediocre and this is primarily the consequence of intrinsic deficiencies in their planting stock. Success in the market will be dependent first on the introduction of superior cultivars, either Madras or Alleppey types; the former presents the greater market opportunity in terms of scale of demand. The prospects for new producers of turmeric oleoresins are not great in the medium term in view of the existing competitiveness of the market and the established, dominant position of India. Profitability can be ensured by operating the equipment at close to maximum capacity for producing a range of spice oleoresins, using high quality raw materials.

### Warehouses & Locations

Pls. visit [http://www.ncdex.com/downloads/WH\\_List\\_10012006.doc](http://www.ncdex.com/downloads/WH_List_10012006.doc) for latest NCDEX list of accredited warehouse at different locations

Pls. visit [http://www.nbhcindia.com/Designated\\_Warehouses.pdf](http://www.nbhcindia.com/Designated_Warehouses.pdf) for latest list of MCX list of accredited warehouse at different locations

### DELIVERY CENTERS:

#### NCDEX:

Main Delivery Centre: Nizamabad  
Additional Delivery Centre: Sangli, Erode and Duggirala

### Contract Specifications:

#### NCDEX: Turmeric

Basis Price	Unpolished turmeric fingers, Nizamabad quality, ex-warehouse Nizamabad, inclusive of all taxes
Unit of Trading	10 MT
Quotation/Base Value	Rs. per quintal
Tick size	Re. 1
Delivery Unit	10 MT

## APPENDICES

### VARIETIES

The major varieties of turmeric are as follows:

#### **Alleppey turmeric**

This is marketed in Alleppey district of Kerala, but is grown in the surrounding regions, particularly in the Thodupuzha and Muvattapuzha areas. Alleppey turmeric is deep yellow to orange-yellow in colour. It has curcumin contents up to 6.5 per cent. Almost the entire production of Alleppey turmeric is exported in the unpolished form mainly to the US, where it is used largely as a food colorant.

#### **Madras (Salem) turmeric and Erode Turmeric)**

This type is marketed in Madras district of Tamil Nadu but grown from several regional cultivars. The rhizomes are mustard-yellow in colour and have a curcumin content of around 3.5 per cent. In domestic and international markets, **Salem turmeric** has established itself as the best quality and it fetches a higher price compared to the price of Erode turmeric. The superior quality of Salem turmeric is due to good soil conditions and less cross contamination. Salem turmeric is the most common type used in the UK, where it is regarded as superior in quality and flavour.

**Other Indian Varieties:** Other important varieties include Rajpur and Sangli turmeric of Maharashtra and Nizamabad bulbs of Andhra Pradesh.

#### **West Indian turmeric**

This term embraces the spice exported from the Caribbean, Central and the South American countries. The rhizomes of this variety are a dull yellowish-brown in colour, mostly small and of poor appearance. West Indian turmeric is regarded as inferior in quality to Indian turmeric.

### Turmeric Products

Value added products from turmeric include curcuminoids, dehydrated turmeric powder, oils and oleoresin.

#### **Dried rhizome**

Turmeric is mostly imported as a whole rhizome, which is then processed into powder or oleoresin by flavouring houses and the industrial sector. Rhizomes come as fingers, bulbs and splits. Fingers are the secondary branches from the mother rhizome, the bulb, and splits are the bulbs cut into halves or quarters before curing. The fingers are 2 to 8 cm long and 1 to 2 cm wide, and are easier to grind than the more fibrous bulbs and splits, and therefore command a higher price.

#### **Turmeric powder**

Ground turmeric is mostly used in the retail market, and by food processors. Rhizomes are ground to approximately 60-80 mesh particle size. Since curcuminoids, the colour constituents of turmeric, deteriorate with light and to a lesser extent, under heat and oxidative conditions, it is important that ground turmeric is packed in a UV protective packaging and appropriately stored. Turmeric powder is a major ingredient in curry powders and pastes. In the food industry, it is mostly used to colour and flavour mustard.

#### **Oleoresins**

Turmeric extractives, or oleoresins, are obtained by solvent extraction of the powdered or comminuted rhizome. This process yields about 12 per cent of an orange/red viscous liquid, which depending on the solvent used and on the turmeric type and cultivar, contains various proportions of the colouring matter, i.e. the curcuminoids, the volatile oils which impart the flavour to the product, and non-volatile fatty and resinous materials. The compounds of interest in turmeric oleoresin are the curcuminoids (40 to 55 per cent), and volatile oils (15 to 20 per cent). The curcuminoids, which consist mostly of curcumin, can be further purified to a crystalline

material, and are used preferably in products where the turmeric flavour is undesirable. The advantage of spray-dried turmeric oleoresin over ground turmeric powder is that it is devoid of starch, the predominant component in dried rhizome, and also proteins and other fibres.

### **Essential oil**

Turmeric essential oil is of little interest in the western food industry and it has no commercial value as opposed to oleoresin. However, there is an increasing literature showing the medicinal properties of turmeric, of which some are attributable to compounds present in the volatile fraction. Turmeric essential oil is obtained by distillation, or by supercritical fluid extraction of the powdered rhizome. It is also the product of curcuminoids purification from oleoresins.