

# Pakistan produces 8% of world's Mango

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"King of Fruits", Mango is one of the most popular and best-loved fruits and one of the most important fruit crop in the world as well as in Pakistan. It is a delicious fruit being grown in more than 100 countries of the world.

Mango is one of the common fruit in most continents, particularly in Asia, Central and South America and Africa. Global production of mangoes is concentrated mainly in Asia and more precisely in India which produces an average of 16 million tonnes a year. Mangoes are now growing in more than 100 countries of which more than 65 countries produce each more than 1,000 tonnes a year. Total world production of mangoes is about 40 tonnes which played an integral part in the lives of many, not only by being a rich nutrient source but also as a source of livelihood for millions of peoples in the tropics.

Mango can be grown under both tropical and sub-tropical climate from sea level to 1400 m altitude, provided there is no high humidity, rain or frost during the flowering period. Places with good rainfall and dry summer are ideal for mango cultivation. Mangos grow in almost any well-drained soil whether sandy, loam or clay, but avoid heavy, wet soils.

Mango trees are deep-rooted, symmetrical evergreens that attain heights of 90 feet. Mango trees have simple alter-

Province	2012-13	2013-14	2014-15	2015-16
Punjab	109,141	107,238	107,055	107,085
Sindh	60,467	63,144	62,732	62,733
KPK	350	355	353	354
Baluchistan	552	552	574	575
Total	116,110	171,289	170,714	170,747

Source: Ministry of National Food Security and Research, Government of Pakistan.

nate lanceolate leaves that are 12 to 16 inches in length and yellow-green, purple, or copper in colour when young.

Mangoes form a regular part of the diet of people in areas where the fruit is easily grown; it may be eaten ripe or green. The Mango is the most important fruit of Asia, and Pakistan ranks fourth in the total production among major fruit crops worldwide after bananas and plantain, citrus, grapes and apples. The major Mango exporting countries are Mexico, The Philippines, Pakistan, Brazil and India.

The rapid growth of global Mango production in recent years has been due to its expansion into new growing regions of the New Worlds, China and parts of Africa; the planting of regular bearing selections; and the adoption of modern field practices, which include irrigation management, control of flowering, etc. There is an estimated 3.7 million hectares

of mango worldwide. Mangoes form a regular part of the diet of people in areas where the fruit is easily grown; it may be eaten ripe or green.

## Mango Production

Hundreds of varieties of mangoes are known to exist in Pakistan. The most popular commercial varieties - all different in colours and sizes, and each with a distinct flavour and taste - include Anwar Retol, Dasehri, Langra, Chaunsa, Sindhri, Saharni, Alphonso, Pairi, Fazli and Neelam. The king of fruits grown in Punjab and Sindh provinces of Pakistan are available in abundance from May to September.

In Pakistan, total area under Mango cultivation is 170 million hectares with the production of 175 million tonnes being the second major fruit crop of Pakistan produces 8% of world's Mango and mainly exports to Middle East, Germany, Japan, Italy and UK making its valuable contribution as an important foreign currency earning fruit crop. Pakistani Mango is recognized as one of the best of its kind in the world market. Pakistan is now the 4<sup>th</sup> largest producer in the world behind India, China, and Thailand. It has been observed that in the past few years the production of quality Mangoes is on the decrease. Pakistan's horticulture has been badly hit by global warming and extreme

Table 2: Production of Mango (Tonnes)

Province	2012-13	2013-14	2014-15	2015-16
Punjab	109,141	107,238	107,055	107,138
Sindh	60,467	63,144	62,732	63,850
KPK	2,964	3,005	3,980	3,015
Baluchistan	1,076	1,076	1,076	1,077
Total	173,648	174,463	173,843	175,080

Source: Ministry of National Food Security and research, Government of Pakistan.

weather, and a major casualty this season has been the Mango crop in Punjab. Mango output has also been affected in south Punjab where fruit plants in Rahim Yar Khan, Muzaffargarh and Multan. However, the crop in Sindh is comparatively less affected and only a 10% reduction is likely in its share of 35% in the country's total Mango output. In southern Sindh, Mango production has not been a viable business over the years due to harsh weather.

Pakistani Mangoes are high in fibre, low in calories and contain a small amount of carbohydrates, calcium, iron, potassium and a little protein. They are rich in vitamins A, B and C and also contain other antioxidant vitamins.

Nature has blessed Pakistan with agro-climatic conditions which permit quality production of Mango. Per hectare

average yield of Pakistan is 11.20 tonnes per hectare which is on the low side as compared to the other major mango producing countries of the world e.g. China and Brazil. Most of the countries cultivate varieties like Haden, Tommy Atkins, Kent and Keitt. While most important commercial cultivars of Pakistan are Dashehari, Anwar Ratul, Langra, Chaunsa, Sindhri, Maldha, Fajri. More than half of Mango area (107 thousand hectares) lies in Punjab followed by Sindh (63 thousand hectares) with minor acreage in Baluchistan (0.6 thousand hectares) and KPT (0.3 thousand hectares). Districts which are important regarding cultivation of Mango in Pakistan are Bahawalpur, Dera Ismail Khan, Hyderabad, Multan, Khanewal Sahiwal, Muzaffar Garh, Sadiqabad, Rahim Yar Khan, Vehari and Thatta.

Approximately 1% of Mango production is utilized for processing for juice, nectars, preserves, fruit leather, dried fruit slices, frozen pulp, and as flavouring for baked goods, ice cream, yoghurt, etc. Province-wise area under Mango and production are given in **Table-1** and **Table-2**.

### World Mango Production

Mangoes account for approximately 50% of all tropical fruits produced worldwide. With 13.5 million tonnes produced annually,

**Table 3: Top 10 Mango Producing Countries of the World (Tonnes)**

Rank	Country	Producing
1	India	16,337,400
2	China	4,351,593
3	Thailand	2,550,600
4	Pakistan	1,784,300
5	Mexico	1,632,650
6	Indonesia	1,313,540
7	Brazil	1,188,910
8	Bangladesh	1,047,850
9	Philippines	823,576
10	Nigeria	790,200

Source: FAOSTAT

India accounts for almost half of the world production, followed by China (4.3 million tonnes), Thailand (2.5 million tonnes), Pakistan (1.78 million tonnes) and Mexico (1.6 million tonnes).

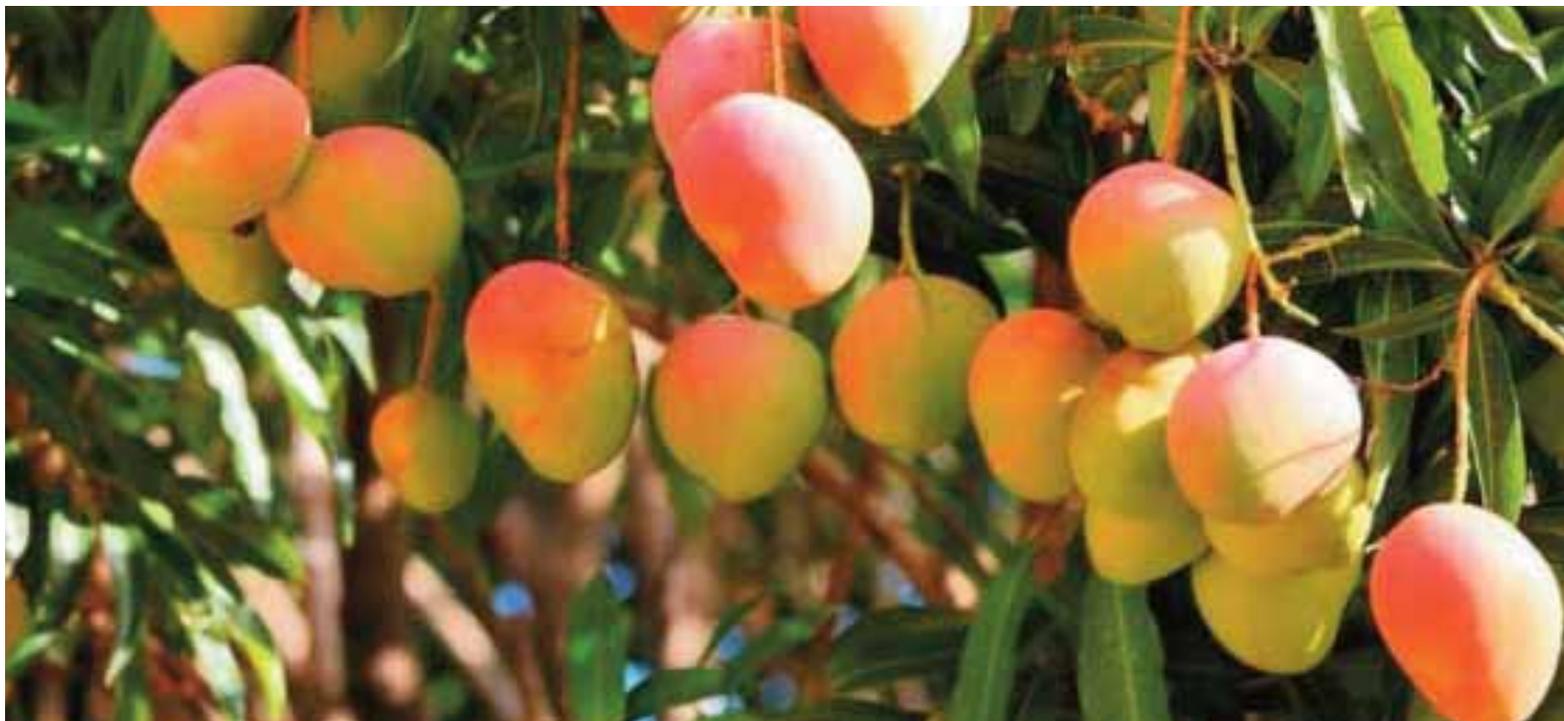
The aggregated production of ten countries is responsible for roughly 80% of the entire world mango production. And most mango producing countries still have potential to increase their production. Europe is not very active in the production of mangos. The same applies to the United States of America, which only have marginal mango production in Florida and Hawaii. The Australian mango industry is highly innovative and based upon research. Top 10 Mango producing countries of the World are given in **Table-3**.

**Table 4: Export of Mango from Pakistan**

Year	Quantity (Tonnes)	Value	
		(Rs. Million)	US \$ (000)
2007-08	68,879	1,744	22,280
2008-09	73,437	2,307	29,491
2009-10	84,921	2,522	29,382
2010-11	89,552	2,889	33,797
2011-12	85,119	3,272	36,623
2012-13	103,487	4,706	48,646
2013-14	86,001	4,977	48,370
2014-15	65,311	4,627	45,677
2015-16	64,112	5,044	48,386

Source: Trade Development Authority of Pakistan





**Exports:** Overall export of Mango has witnessed a steady growth. In 2011-12, Mango exports were 85,119 tonnes valued at US\$ 36.6 million which increased to 64,112 tonnes valued at US \$ 48.4 million in 2015- 16. The most important reason of Pakistani Mangoes popularity is its sweet taste and a beautiful golden colour. These Mangoes have a lavish size with a sweet taste, but its sugar taste is not horribly sweet. Unlike the other Mangoes which have large sugar counterparts, Pakistani Mangoes have a normal sweet taste which helps more than one Mango at a time. Export

trend of Mangoes from Pakistan are given in **Table-4**.

The country has so far exported 64,112 tonnes of Mangoes valued US \$48 million in 2015-16 to UAE, Saudi Arabia, Oman, UK and Canada. UAE is the largest importer with market while Oman and Saudi Arabia are second and third largest importers. Country-wise exports of Mango from Pakistan are given in **Table-5**.

Pakistani mangoes have successfully entered in many new markets including Japan, USA, Lebanon, Mauritius and

South Korea. Due to improper infrastructure, lack of marketing (traditional marketing practices) and poor advertising strategies and increasing SPS concerns of importing countries, Pakistani mango has failed to tap any significant share of these potential markets.

Pakistan can raise its mango export by addressing mango trade problems related to health and hygiene standards, post-harvest losses and capacity building of stakeholders on SPS and quality standards, training on quality management and creating awareness of packing, packaging and labelling requirements of high end markets, adaption of modern refrigeration methodologies and development of proper infrastructure.

Tough export procedures and formalities (regulations, charges and other restrictions) are hindering the mango export. The lack of direct flight services, shortage of air cargo space and inadequate cargo handling limit the export of highly valued fruit despite its high demand.

**Problems:** The Soil and climatic conditions in Pakistan support Mango production in terms of yield and quality. However, the country is not able to acquire the desired results. Number of factors contributes towards low production of Mango. Unchecked use of unhealthy seeds form diseased seedlings, Insect attack (Mango mealy bug, fruit fly, Mango weevil, scales, mites), alternate bearing, Mango malformation(vegetative or reproductive) and diseases (powdery mildew, anthracnose, quick decline, sooty

**Table 5: Country-wise Export of Mango (Major Countries)**

Country	2014-15		2015-16	
	Quantity	Value	Quantity	Value
Afghanistan	2,391	95,749	265	11
Bahrain	563	53,580	679	55
Canada	802	85	1,210	105,688
Germany	1,066	138,685	625	90,639
Italy	320	36,454	237	30,335
Japan	14	1,840	257	38,411
kuwait	295	18,893	118	13,991
Malaysia	690	61,539	317	41,617
Norway	685	72,678	682	97,838
Oman	6,263	365,470	7,124	393,396
Saudi Arabia	4,671	436,093	4,897	540,136
U.A.E	37,223	2,114,513	36,196	2,077,615
U.K	6,203	685,670	8,241	1,145,582
All others	4,125	545,818	3,264	468,572
<b>Total</b>	<b>65,311</b>	<b>4,627,067</b>	<b>64,112</b>	<b>5,043,886</b>

Source: Pakistan Bureau of Statistics.

mold, fruit rot and stem blight) are the greatest threat to the industry in major Mango producing countries, including Pakistan. Also, low pollination, less fruit setting (less than 0.1%), high fruit drop percentage, unnecessary stresses (injury) and improper management practices during budding or grafting, time of irrigation, pruning and time of application of fertilizers are contributing substantially to the downfall of the industry. Adding to the ever increasing problems are the postharvest losses contributing almost 40% to 50%. Different countries have their own requirements for processing and treatment, but the most commonly used method in vogue is hot water treatment (HWT), radiation and vapour treatment. Shortage of hot water treatment plants in the country has a major role in declining export to the valued markets, especially European markets.

The main responsible factors which affect the vitality and yield of mango are shortage of water, insect's pests and diseases. In the recent years besides other diseases and insects of mango, sudden death quick decline problem, attained the status of major malady. The disease attacks the collar region at the xylem of the main trunk and roots. Infect bark at the collar region as well as the roots turns brown and rotten, besides that, bark beetle *Hypocryphalus* symptoms are associated with the root portion and main trunk and then branches also, the *Hypocryphalus* Spp.



In order to reach high end markets of the World (China, Iran, Japan, Australia, New Zealand) the mangoes of Pakistan must meet WTO/HACCP/ISO and SPS requirements. For the said purpose, quarantine of mangoes through physical or chemical treatment is essentially required. Chemical treatment face severe restrictions from different countries, therefore, physical methods such as hot water treatment (HWT), vapour heat treatment (VHT) and irradiation are preferred. Among the physical methods of quarantine, HWT is most economic and safe.

The HWT procedure consist of dipping/immersion of freshly harvested mangoes in hot water at 45-55°C for 3 to 75 minute depending on type of disease/insect, variety and fruit size. After dipping/immersion of the mangoes in hot water, mangoes are dried and processed for packing. In order to achieve this goal AMRI has got a project from PARB " optimization and standardization of operational parameters of hot water treatment (HWT) system to control post-harvest diseases and insects of mangoes.

The hot water treatment system comprise of a feeding conveyor, hot water dipping tank, drying system and packing tray. Each component except packing tray is mounted on wheels for ease of transportation. The water tank is made of stainless steel in order to avoid rusting. The water is heated through three gas burners.

The required temperature of the water tank is adjusted in the panel, when the water temperature reaches to the adjusted temperature burners automatically off. Eight thermo couples are fitted in the water dipping tank in order to check the temperature at different sites of the tank. The water is agitated with a power full two no re circulation pumps. This agitation keeps the water evenly mixed and helps maintain temperature evenly. The size of the tank is big enough that there is no appreciable drop in temperature in the tank when the fruit is dipped. In the drying system mangoes are dried with the help of two no high speed electric fans. After drying the fruits are allowed to drop in the packing tray from where these are packed.

An electric panel is fitted outside the water dipping tank. All the motors, pumps and fans are controlled from here. Total number of hot water treatment plants has increased to 29 in 2015. These plants have the capacity to treat 2,000 tonnes to 2,500 tonnes of Mangoes per day.

#### References:

1. Ministry of National Food Security and Research, Government of Pakistan.
2. Pakistan Bureau of Statistics.
3. Pakistan Economic Survey- 2015-16, Government of Pakistan.
4. Trade Development Authority of Pakistan. ♦