



## COMMODITY PROFILE– MUSTARD SEED

Mustard seed or Rapeseed, which is cultivated throughout the world, belongs to the family Cruciferae under the genus Brassica with large number of species and sub species cultivated in India. *Brassica juncea* L. (rai) was originally introduced from China into northeastern India, from where it has extended into Afghanistan via Punjab. Eastern Afghanistan, together with the adjoining northwestern India is one of the independent centers of origin of brown sarson (*Brassica campestris* var. brown sarson).

Mustard seed is the second most important edible oilseed crop in India after groundnut and accounts for nearly 30% of the total oilseeds produced in the country. Mustard oil is obtained by extraction process of the crushed mustard seeds. During the production of oil, pressed cakes of the seeds are kept with some amount of oil which are distilled and used as oil cakes, which is served as animal feeds.

### **Economic Importance**

- Mustard is important edible oilseed, oil content of the seeds ranges from 38- 46%.
- The seed and oil are used as a condiment in the preparation of pickles and for flavouring curries and vegetables.
- The oilcake is mostly used as cattle feed.
- The leaves of young plants are used as a green vegetable.
- The use of mustard oil for industrial purposes is limited on account of its high cost.

## Uses of Mustard

**As edible oil:** Mustard seed contains 30–46% oil and it is one of the most important oil in India. It is commonly used in Northern and Eastern India. There are two types of mustard oil, which are popular in India i.e., the kacchi ghani type and refined mustard oil. The Kacchi Ghani type is preferred by most of the consumers due to its characteristic colour and pungency. The refined oil is preferred by the health conscious people.

**As spices:** It is used in India as well as in European countries like France, Italy as versatile spice for culinary preparation of fish, meat, vegetables etc.

**As fertilizer:** It is used as fertilizer to increase productivity of sugarcane, berseem, papaya, tea plantations, orchids and planktons in pond.

**As a preservation medium:** Mustard oil is widely used as medium of preservation for preparation of pickles, chutney and other preparations.

**As seed meal:** Due to rich in protein and low in glucosinolate content, it has a high demand as ingredient for cattle feed and poultry feed in India. It is in highly demanded by the feed millers and exported to various foreign and Mediterranean countries.

**Medicinal application:** Mustard oil has antifungal properties, hence beneficial for body massage for control of skin diseases. For healing joint pains and rheumatic disease, the oil is also used by mixing with garlic and turmeric. It strengthens the gums if taken with salt and alum. It is also noticed that sleeping on mustard seeds gives the bio-energetic healing massage effect. Moreover, it is used to relieve backache, muscle pain, anxiety, depression and insomnia.

**Industrial application:** Mustard seed contains “erucic acid” which has immense industrial applications. ‘High Erucic Acid Rapeseed’ (HEAR) oil is the non-edible variety of oil, which is used for industrial purposes. The global market for low erucic acid rapeseed oil is increasing day by day.

**Table 1: Classification of Mustard**

English name	Vernacular name	Botanical name	Characteristics of seeds
Indian mustard / Brown mustard	Rai, ryada, raya, laha, lahta, sasve, herbo	<i>Brassica juncea</i> (L.) Czern. & Coss.	Seeds are medium sized, round and dark brown or black in colour.
Indian rape / Rapeseed/ Toria	Toria, tori, lahi	<i>Brassica rapa</i> L. var. <i>toria</i> (syn. <i>B. campestris</i> L. var. <i>toria</i> .)	Seeds are dark brown, Bold and large sized.
Brown sarson /Rapeseed	Brown-sarson, Bhoori- sarson	<i>Brassica rapa</i> L. var. <i>brown sarson</i> (syn. <i>B. campestris</i> L. var. <i>brown sarson</i> )	Seeds are light reddish in colour, bold, large sized.
Yellow sarson /Colza/Rapeseed	Yellow sarson, Pilli sarson	<i>Brassica rapa</i> L. var. <i>yellow sarson</i> (syn. <i>B. campestris</i> L. var. <i>yellow sarson</i> )	Seeds are slightly smaller than sarson, size is ovoid in shape, yellow in colour.
Rapeseed	Gobhi sarson	<i>Brassica napus</i> L.	Seeds are brownish black and large sized.
Abyssinian mustard/Ethiopian mustard	Karan rai	<i>Brassica carinata</i> A. Br.	Seeds are small, round and reddish brown in colour.
Rocket Salad	Duan, tera, tara, saundh , taramira	<i>Eruca sativa</i> Mill	Seeds are light reddish brown coloured and distinctly ovoid shape.

### Mustard Seed Seasonality

Mustard crop are of the tropical as well as of the temperate zones and require relatively cool temperatures for satisfactory growth. Australia is one of the biggest producers of mustard seed/canola with New South Wales, Western Australia and Victoria being the main producing regions. The harvest time is usually from mid October to December in Australia. In Canada, harvesting period is from mid August to mid October. Anhui, Hubei, Sichuan, Jiang Su, Hunan, Jiang Xi are the major producing provinces in China with more than 70% of the country's production coming from these regions. The harvesting season in China is April-May. In European Union Germany, France, Poland, Sweden, U.K. are the major

producers of rapeseed with major harvesting done during June-July period. Ukraine is also a big producer with produce coming from July to September.

**Fig. 1: Mustard seed crop calendar**

COUNTRY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CHINA												
EU-25												
CANADA												
INDIA												
AUSTRALIA												

Sowing  Harvest 

In India, Mustard/Rape seed is grown in rabi crop from September-October to February-March.

**Sowing Season:** September - October

**Harvesting Season:** February – March

**Arrivals Season:** The peak arrivals can be seen during February-April across the country.

### Maturity Period of Harvesting for Mustard Seed

- Toria 70-100 days
- Indian mustard 105-160 days
- Yellow sarson 120-155 days
- Brown sarson 100-235 days
- Taramira 140-150 days

### Grading

**Cleaning and sorting:** After arrival, entire produce should be cleaned and sorted manually / mechanically to separate the foreign matter, dust, dirt and stone particles, admixture of other seeds, husks, immature split, shriveled, damaged and diseased grains.

**Packing and sealing:** The cleaned and sorted homogenous produce should be filled in gunny bags and then packed and sealed.

**Sampling and analysis:** For successful grading of a lot, the drawing of truly representative sample is essential and it is done in such a way so that it reveals the exact composition of the commodity. Subsequently, the grading process is done by physical analysis of the samples and in addition to it, it is analysed separately by separate instruments for determining oil content and moisture percentage of seeds.

### **Packaging**

**Plastic film bags:** Two types of polythene films are available viz. low-density polyethylene film (LDPE) and high-density polyethylene film (HDPE) for packaging purposes. But in most cases, LDPE is used as plastic film bags for packaging mustard seeds. It protects the oilseeds against dust, dirt and moisture. It is convenient for packing of smaller quantities of oilseeds like 1kg, 5kg, and 10kg packs.

**Corrugated fibre board:** These are paperboard cartons used for keeping the plastic bags filled with mustard. It protects oil seeds from dust, dirt and to some extent from moisture.

**Jute bags:** Gunny bags made of jute are widely used by producers, traders, processors, etc, for packing of mustard. Traders use gunny bags for storing oilseeds and keep them in go-down by stacking. Seeds of mustard are generally packed in 'B' twil jute bags of 95kg capacity. Sometimes the oilseeds are stored in 50kg jute bags.

### **Storage**

Before storage, it is essential to clean oil seeds and remove plant foliage and stems etc, which initiate the heating, development of carbon-dioxide and quality deterioration in seed mass. Mustard seed should be stored under low moisture content (8%) and temperature (25°C). In storage, mustard seed is protected from the time of plenty during production period to future consumption during scarcity period.

## Global Scenario

Mustard crop is grown both in subtropical and tropical countries. In Asia, it is mainly grown in China, India and Pakistan. It is also grown in Europe, Canada and erstwhile USSR, but the forms of mustard are different from those grown in India. Global rape/mustard seed output is at 56 million tonnes in 2008-09, up from 49 million tonnes last year. World rape/mustard oil production is forecast at 20.60 million tonnes in 2008-09, up from 19.4 million tonnes last year.

### World Supply & Demand

**Table 1: World Supply-Demand Balance (Million tons)**

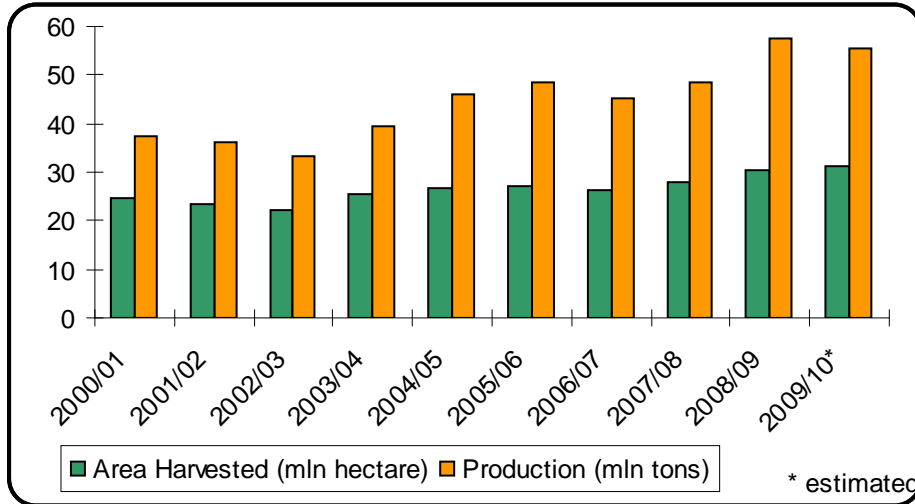
Year	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Beginning Stocks	2.69	2.78	2.17	2.10	4.75	5.51	4.66	3.39	6.53
Production	36.01	33.26	39.43	46.09	48.50	45.09	48.29	57.55	55.48
MY Imports	4.95	4.03	5.15	5.02	6.68	7.01	7.56	11.28	10.02
MY Imp. from U.S.	0.23	0.28	0.30	0.17	0.18	0.22	0.20	0.12	0.18
Total Supply	43.65	40.07	46.75	53.20	59.93	57.61	60.52	72.21	72.04
MY Exports	4.90	4.13	5.49	4.90	6.98	6.63	8.21	11.13	10.23
Crush	33.48	31.59	36.41	40.58	44.62	43.62	46.52	51.85	54.35
Food Use Dom. Cons.	0.44	0.38	0.62	0.63	0.30	0.53	0.46	0.48	0.53
Feed Waste Dom. Cons.	2.06	1.80	2.12	2.35	2.53	2.18	1.94	2.22	2.32
Total Dom. Cons.	35.98	33.77	39.16	43.56	47.44	46.32	48.92	54.55	57.21
Ending Stocks	2.78	2.17	2.10	4.75	5.51	4.66	3.39	6.53	4.60
Total Distribution	43.65	40.07	46.75	53.20	59.93	57.61	60.52	72.21	72.04

Source: USDA

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## World Area and Production

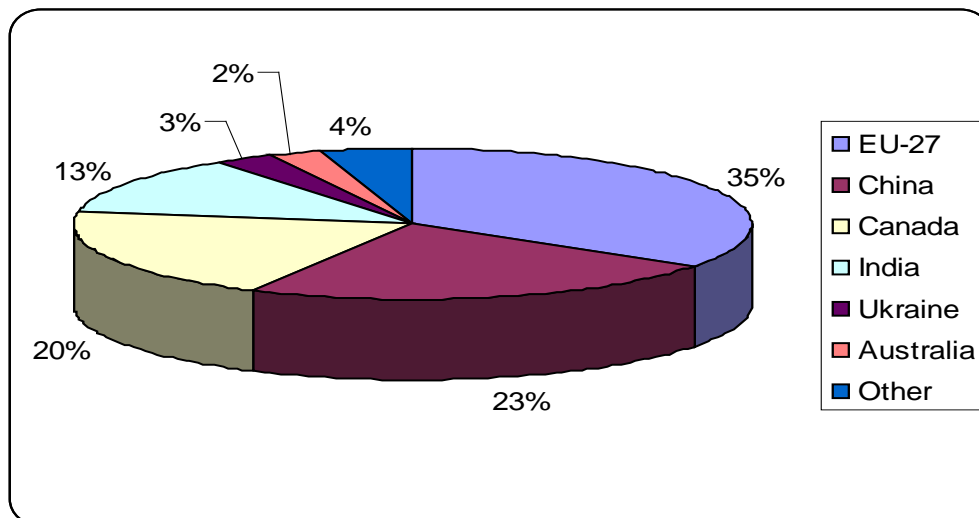
**Fig. 2: Mustard Seed Area and Production**



Source: USDA

Global mustard seed production is averaged at 50 million tons (Average from 2005-06 to 2009-10) with an area of around 28 million hectare. Along with increasing area and yield, production is also witnessing an increasing trend. In 2009-10, production is estimated at 55.5 million tons.

**Fig. 3: Major Mustard Seed Producing Countries**

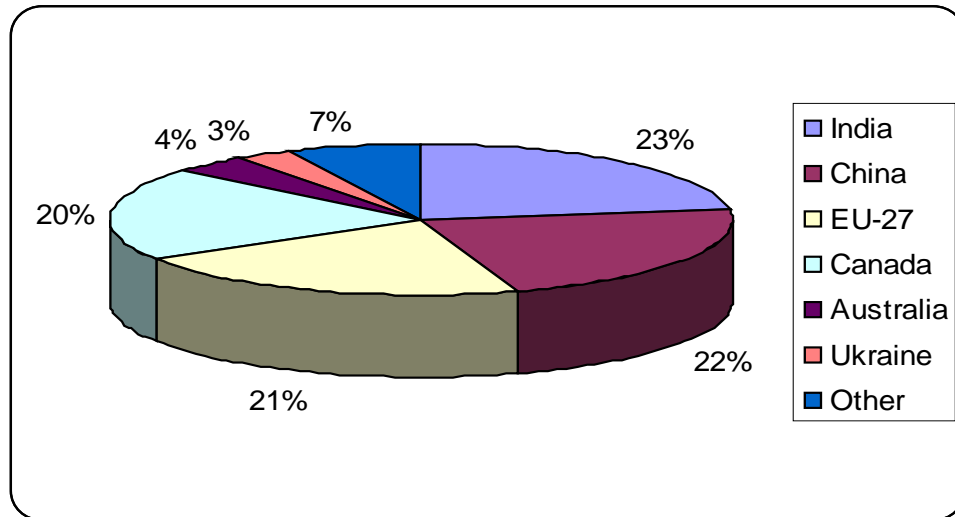


Source: USDA

**Note:** Avg. global mustard seed production from 2005-06 till 2009-10 is 50 million tons.

Major producing countries of mustard seed are EU-27 with the share of 35% in production followed by China (23%) and Canada (20%) and India with the share of 13%.

**Fig. 4: Share of Major Countries in Mustard Seed Area**



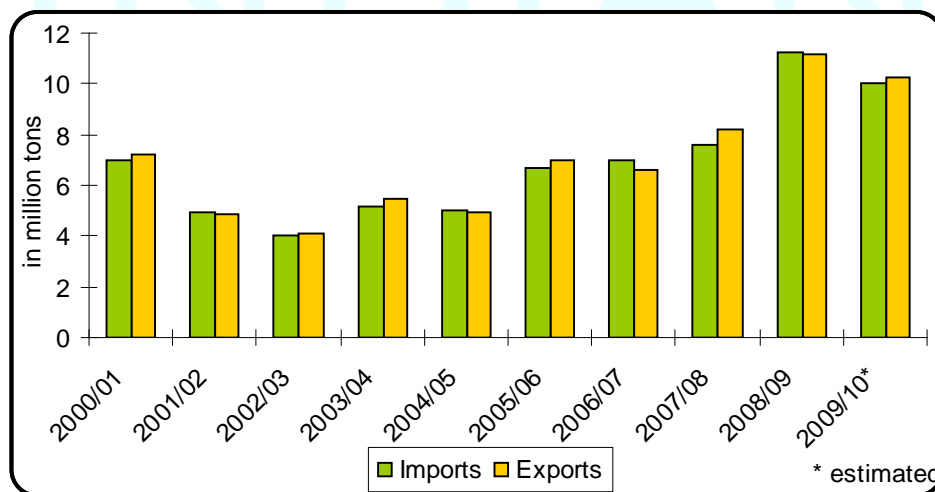
Source: USDA

**Note:** Average global mustard seed area from 2005-06 till 2009-10 is 28 million ha.

In terms of acreage, India ranks first followed by China, EU and Canada. Due to dependence of rain fed area, India's productivity is compared with other countries.

### EXIM Trade

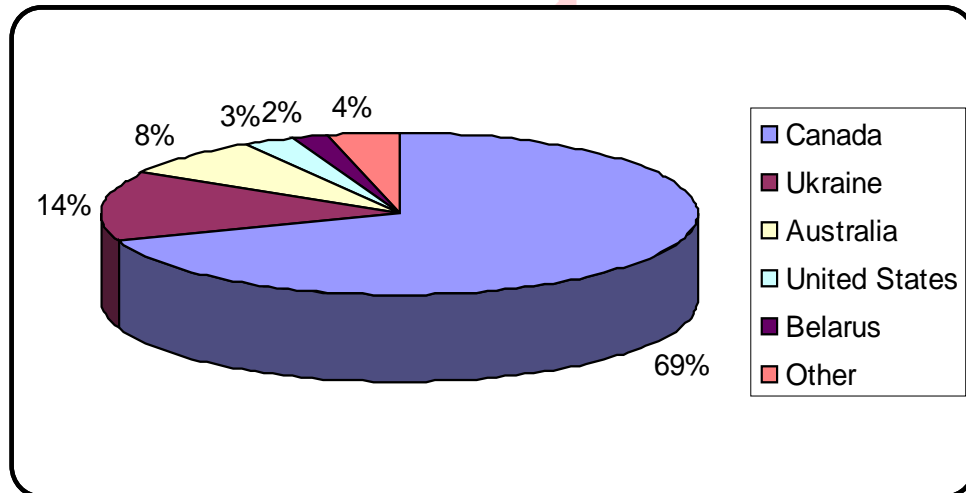
**Fig. 5: Global Mustard Seed Export and Import**



Source: USDA

Global trade of mustard seed has witnessed an increasing trend due to its importance as oil and meal. On an average, annual export is averaged at around 8.6 million tons and import at 8.5 million tons (avg. of 2005-06 to 2009-10). In 2008-09, the EXIM trade was at the peak with 11.13 million tons of total export and 11.28 million tons of total imports.

**Fig. 6: Major Exporting Countries**



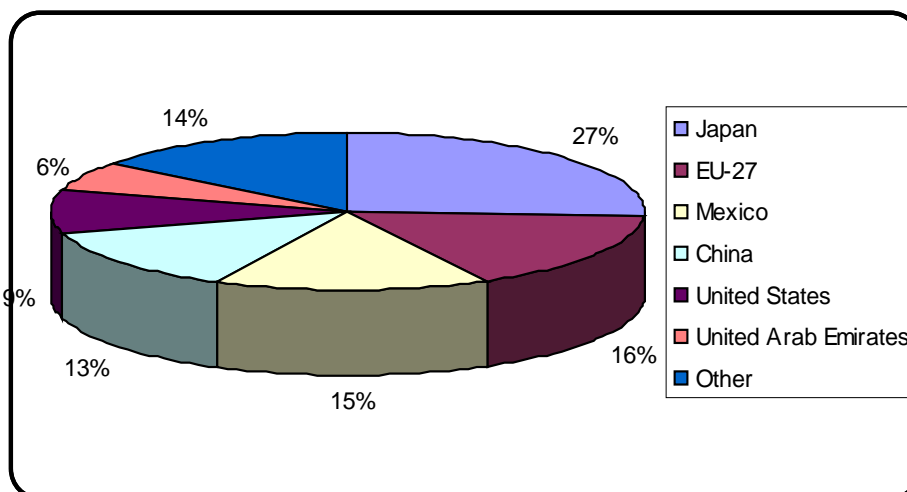
Source: USDA

**Note:** Average global mustard seed export from 2005-06 till 2009-10 is 8.6 million tons.

Among exporting countries, Canada is on the top with the share of 69% of total global exports. Other major exporting countries are Ukraine with the share of 14% followed by Australia, United States and Belarus.

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**Fig. 7: Major Importing Countries**

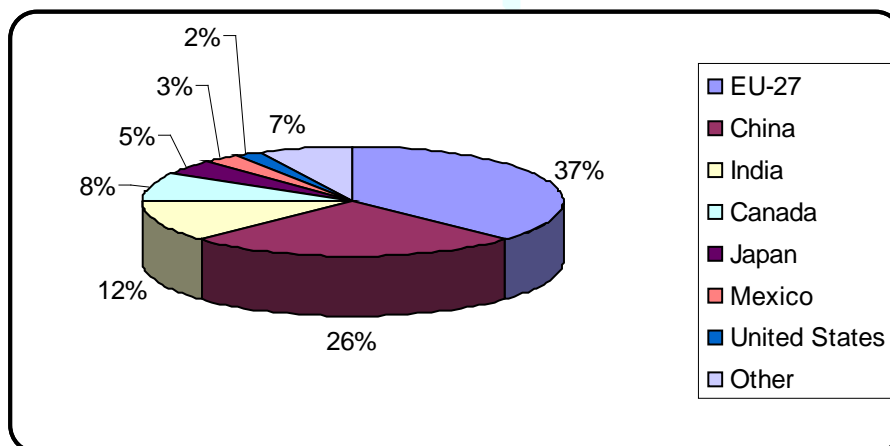


Source: USDA

**Note:** Average global mustard seed import from 2005-06 till 2009-10 is 8.5 million tons.

Major importing countries of mustard across the globe are Japan (27% of total global import), followed by EU comprising 27 countries, Mexico, China and United States.

**Fig. 8: Major Crushing Countries**



Source: USDA

**Note:** Avg. global mustard seed crushing from 2005-06 till 2009-10 is 48 million tons.

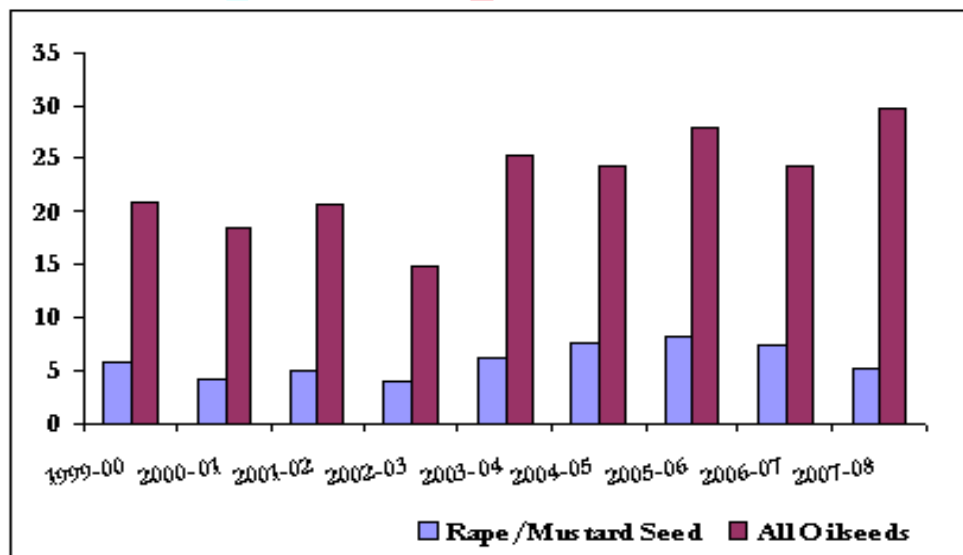
Mustard seed is crushed for extraction of oil and cake. Mustard seed meal is widely consumed as feed across the world. Major crushing countries are EU, followed by China, India, Canada and Japan.

## Domestic Scenario

Mustard seed is one of the major sources of oil and meal to India. Mustard is traditionally the most important oil for the Northern, Central and Eastern parts of the country. The pungency of the oil considered is the major 'quality determining' factor.

### Mustard Seed & Oilseeds Production in India (in Million Tonnes)

Fig. 9: Mustard Seed vs Oilseeds Production



Source: Solvent Extractors Association of India

In 2007-08, mustard seed production decreased and it accounted for only 17.8% share of total oilseeds production in India. In 2006-07, mustard seed production accounted for 30% of total oilseeds production.

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## Supply & Demand of Mustard Seed in India

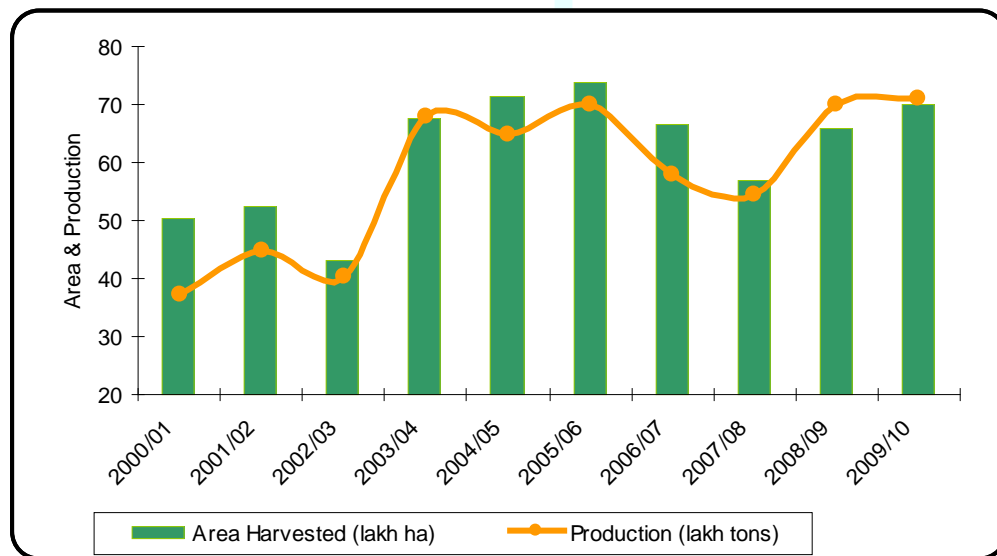
**Table 2: Supply-Demand Balance of Mustard Seed**

Year	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Beginning Stocks	3.9	3.2	5.91	7.42	11.24	4.95	1	4.76
Production	40.5	68	65	70	58	54.5	70	71
Marketing Year Imports	0.18	0.07	0.18	0.27	0.25	0.25	0.2	0.2
Total Supply	44.58	71.27	71.09	77.69	69.49	59.7	71.2	75.96
Marketing Year Exports	0.06	0.04	0.02	0.08	0.05	0.04	0.04	0.05
Crush	35.68	56.37	54.55	62.1	56.57	52.12	59.5	63.01
Food Use Dom. Cons.	3.83	6.19	6.3	3	5.32	4.59	4.8	5.3
Feed Waste Dom. Cons.	1.81	2.76	2.8	1.27	2.6	1.95	2.1	2.3
Total Dom. Cons.	41.32	65.32	63.65	66.37	64.49	58.66	66.4	70.61
Ending Stocks	3.2	5.91	7.42	11.24	4.95	1	4.76	5.3
Total Distribution	44.58	71.27	71.09	77.69	69.49	59.7	71.2	75.96

Source: USDA

## Area & Production of Mustard Seed in India

**Fig. 10: Mustard Seed Area and Production**

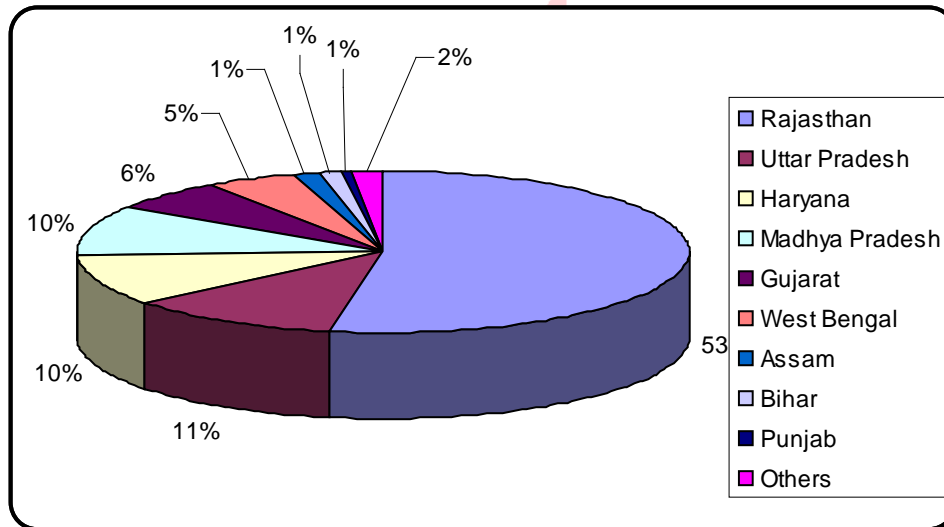


Source: USDA

Mustard seed production is fluctuating over year, as this crop is growing mainly on rainfed area. India ranks first in mustard seed acreage. Here the area rules at 67-lakh hectare per annum (average of 2004-05 to 2009-10) with annual production of around 64.7 lakh tons.

### Mustard Seed Producing States

**Fig. 11: Major Mustard Seed Producing States (Average of 2005-06 to 2006-07)**



**Source:** Ministry of Agriculture

**Note:** Average mustard seed production from 2004-05 till 2009-10 is 64 lakh tons.

Major mustard producing states in country are Rajasthan, accounting more than 50% of its area and production followed by Uttar Pradesh with the production of 11%, Haryana (10%), Madhya Pradesh (10%) and Gujarat (6%).

### Import & Export of Mustard Seed/Oil/Oilmeal from India

India is self-sufficient in mustard seed and oil as import and export of the commodity is almost non-existent. However, India is in export of rapeseed oil meal. In 2008-09 (Apr-Mar), India exported 8.4 lakh tonnes of rapeseed oil meal, lower in comparison to 9.33 lakh tonnes in year 2007-08.

### Major Trading Centers

Delhi and Hapur are the major market for mustard in India and the prices of these markets serve as 'reference' for other subsidiary markets.

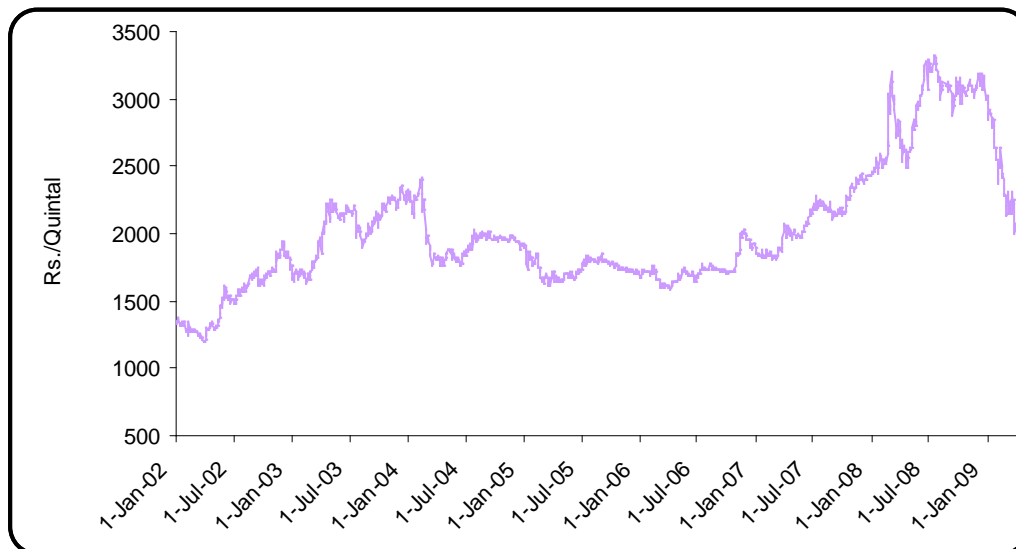
**Table 3: Supply-Demand Balance of Mustard Seed**

State	Major Trading Centers
Rajasthan	Alwar, Bharatpur, Kota, Jaipur, Ganganagar & Bikaner
Delhi	Delhi
Uttar Pradesh	Hapur & Kanpur
West Bengal	Kolkatta & Burdwan
Maharashtra	Mumbai
Madhya Pradesh	Indore

### Mustard Seed Prices

The prices in the country are largely dependent on the domestic production of mustard seed and its arrivals in the market. Peak arrival period is between February and May in these markets. Thereafter, arrivals start declining and least in the month of October.

**Fig. 12: Mustard Seed Prices at Jaipur from 2002 to 2009 (up to May)**



Source: Agmarknet

## Factors affecting Mustard/Rape seed Prices

- Prices of major domestic and internationally traded oils and oilseeds, viz., soy, palm and groundnut.
- The Southwest monsoon, which determines the area coverage and crop yield during the forthcoming rabi season. This also determines the kharif oilseed production, which also has a significant influence on mustard seed prices.
- The growing conditions during rabi - frost, pest.
- Stockiest and speculators dominate the rapeseed trade as mainly small units carry out crushing.

## References

- AGMARKNET
- Ministry of Agriculture
- Food and Agriculture Organization
- Directorate General of Foreign Trade, Ministry of Commerce and Industries
- The U.S. Department of Agriculture (USDA)

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