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# SPICE INDIA



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**JODHPUR SPICES PARK ON STREAM**

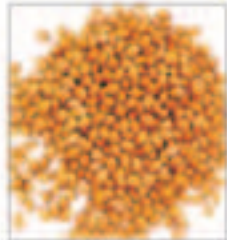
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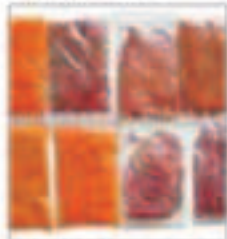
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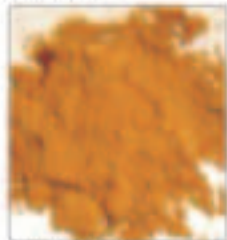
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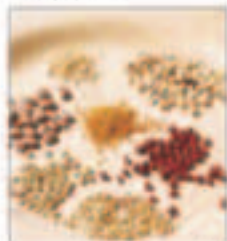
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# SPICE INDIA

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TO THE PROMOTION OF  
INDIAN SPICE INDUSTRY



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COMMISSIONED

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## Spices Board of India to establish 10 Spice Parks by end of 2012

# JODHPUR SPICES PARK COMMISSIONED

- With an investment of more than Rs. 167 crore, the parks will come up in Madhya Pradesh, Kerela, Rajasthan, Andhra Pradesh and Tamil Nadu
- State-of-the-art spice park commissioned in Jodhpur is the first seed spices park in the country
- State-of-the-art spice park commissioned in Jodhpur is the first seed spices park in the country with private and public partnership. Seventeen companies to invest in this project with their own plans for value addition. Exclusive plans by private companies for extraction, leafy spices and dehydration. More unit value realisation for exporters and ultimate benefit for farmers through better value realisation.
- New set of young organisers entering the spectrum of export business of spices with innovative ideas for value addition.
- New segment of business getting developed from just spices in whole and powder to dehydrated leafy spices like kasoopri methi, dehydrated mint besides whole lot of vegetables.
- Platform to showcase the seed spices especially the cumin of Rajasthan, more so because the Spices Park in Jodhpur will indirectly vouch for the spices of Rajasthan.
- The park in Jodhpur was inaugurated by Mr. Anand Sharma, Union Minister of Commerce & Industry and Mr. Ashok Gehlot, Chief Minister of Rajasthan

Spices Board of India, the nodal organization of Ministry of Commerce, Government of India, in an effort to promote exports of spices from India will establish 10 spice parks across the most strategic locations in the country by end of 2012. A total of Rs. 167 cores are earmarked to invest in the spices parks. Out of which Rs. 75 crores are already invested in three completed spices parks in Chhindwara in MP, Puttady in Kerela and in Jodhpur. The other parks will be completed during the year in states like Andhra Pradesh, Tamil Nadu, Madhya Pradesh and Kota in Rajasthan.

The Board has completed the construction of Spice Park in Rampura Bhatian Village of Ozian Tehsil near Jodhpur in an area of 60- acres provided by the Rajasthan Government. The park in Jodhpur was inaugurated by Mr. Anand Sharma, Union Minister of Commerce & Industry and Mr. Ashok Gehlot, Chief





**Mr. Anand Sharma, Hon'ble Union Minister of Commerce & Industry**

Minister of Rajasthan on 7th April 2012. The park has common infrastructure and processing facilities for the seed spices especially cumin and coriander. A public private partnership is ensured with 17 exporters to set up state of the art processing lines and also cold storage facilities and also facilities to produce oils and oleoresins from seed spices. The machineries in the Park are capable for the processing of other seed spices like fennel and fenugreek, which are quite ample in this region.

Mr. Anand Sharma, Union Minister of Commerce and

Industry, said, "We will be focussing on technological development, with foreign direct investments, establishment of cold storages across the country so that the farming population will be benefited through fair prices. The country is facing nearly 40 percent loss of fruits and vegetable as they perish without proper storing facilities." He cited the example of how farmers in Maharashtra are selling onion in the mandies at Rs 2 per kg while ultimate consumer in the terminal markets end up paying Rs 18 per kg. This practice should go and the Government will see that disparity in prices and ensure better return to the farmer. He lauded the Spices Board for the commissioning of the project in record time.

Chief Minister, Mr Ashok Gehlot announced that any extra land available in the vicinity of the park will be given for expanding the Spices Park. Orders were issued to the Revenue Department to transfer the land. He exhorted the farmers to make full use of the facilities in the Park. He stressed the importance of drip irrigation and said 80 percent subsidies are given for this initiative by the



**Mr. Ashok Gehlot, Hon'ble Chief Minister of Rajasthan**

farmers. Mr Gehlot said the Rajasthan Government had waived off interest on loans by farmers to the extent of Rs 8000 crore. Farmers can now avail interest free loan of Rs 1 lakh.

The meeting was attended by the Rajasthan Industry Minister, Mr Rajendra Pareek, Members of Parliament, Mr Chandresh Kumari [ Jodhpur], Mr Badrirma Jhakad [ Pali], Sri Rajendra Singh Solanki, Chairman, Jodhpur Development Authority, Mr Rameshwar Dhadv, Jodhpur Mayor, Mrs Durga Devi, Jodhpur Zilla Parishad Chairperson, Mr



View of audience

## COVER PHOTO CAPTIONS

1. Unveiling of the stone by Mr Ashok Gehlot, Chief Minister of Rajasthan, Mr Anand Sharma, Union Commerce and Industry Minister and, Mr Rajendra Pareek, Industry Minister, Rajasthan.
2. Rajasthan Chief Minister and the Union Commerce Minister viewing the facilities in the processing complex.
3. Rajasthan Chief Minister, Mr Ashok Gehlot, Rajasthan Industry Minister, Mr Rajendra Pareek and Union Commerce and Industry Minister, Mr Anand Sharma lighting the lamp to mark the inauguration of the Spices Park in Rampura Bhatian in Jodhpur.
4. View of the composite cleaning, grading, grinding, packing facility at the Park.

Narayan Dabadi, Pradhan of Ozian, and Mr Preamsingh Parihar, Rampura village Serpanch. Secretary Spices Board, Mr PM Suresh Kumar welcomed the gathering and Dr MR Sudarshan, Director Marketing i/c proposed a vote of thanks.

Both the Commerce Minister and the Chief Minister unveiled the stone to mark the inauguration of the Spices Park and switched on the processing facility. The meeting was attended by a huge crowd of over 3000 people consisting of farmers, villagers, exporters, officials of the various departments, trade associations and chambers of commerce and industry.

A full line processing facility with a capacity to turn out two tonnes per hour has inbuilt facilities for pre-cleaning, grading, colour sorting, grinding and packing. The spice processing facilities available at Spice Park are at par with the international standards. The higher end processing plants installed is a full processing line which includes pre cleaning, grading, colour sorting, grinding and both bulk and consumer packing ranging from 100 g to 50 Kg.

The Board is establishing a sterilization facility within the

plant building with a capacity of 250 Kg per hour in batch process. The Board will also be allotting individual slots for exporters on lease basis for developing their own processing plants in the Parks. There was tremendous response from the exporters who wanted to set up their own facilities in the Park.

The Spices Board has set up other common infrastructures like Compound wall, Road, Drains, Water Distribution system, Power Station, Weighing Bridge, Common parking area, Truck yard, Warehouses, preliminary Quality Testing facility, Bank counter, Training center, Conference Hall, Canteen facilities etc within the Parks.

To ensure storing of raw materials for processing and to take care of the processed materials, the Parks will have warehouses exclusively devoted for various seed spices separately. Two Raw Material Warehouses with a storing capacity of 800 square meters each are devoted for Coriander while two other warehouses for other seed spices have a storing capacity of 800 square meters each.

The Park is being provided with a 33 KVA substation with transformer and 250 KVA D.G.

sets for ensuring an uninterrupted power supply for the working besides a full fire fighting system.

The Board's regional and zonal offices will start functioning from the Spices Park with more orientation towards the spices growing villages. The other facilities provided include conference hall, training hall, and space for establishing mini QC lab, Bank and for Customs.



Another view of audience



# CULTIVATION OF FENUGREEK FOR SPICE AND QUALITY SEED

## Origin and History

Fenugreek [*Trigonella foenumgraecum* L.] is an annual herb of the sub-family *Papilionaceae* of *Leguminosae* family. Fenugreek is a self pollinated, small-seeded annual legume that is grown as a spice crop. Fenugreek (*Trigonella foenum-graecum* L. Family:

Leguminosae) has two areas of origin: the Indian subcontinent and the Eastern Mediterranean Region. Fenugreek is considered to have originated in the Mediterranean region of the “Old World” (Vavilov, 1926) or in parts of Asia (De Candolle, 1964). The species name “*foenum-graecum*” means “Greek hay” indicating its use as a forage crop in the past. Carbonized fenugreek seed recovered from Punjab (India) indicate its use in trade as far back as 2000 -1700 B.C. (Acharya *et al.*, 2006). Even though it is native to Asia (an area extending from Iran to northern India), but now it is widely cultivated elsewhere, including China, North and East Africa, Ukraine and Greece. The major seed producing countries are India, Ethiopia, Egypt and

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Turkey. The volatile oil content of fenugreek is less than 0.02 per cent and it is not commercially very important. Fresh tender pods, leaves and shoots which are rich in iron, calcium, protein, vitamins A & C, are eaten as curried vegetable since ancient times in India, Egypt and other countries. As a spice, fenugreek also adds to nutritive value and flavor of foods. In India, the seeds are used in curries, dyes and medicines. In Europe and North America the seed is used for its pharmaceutical qualities. The endosperm of

fenugreek seed is a gum that surrounds the cotyledons and embryo. The gum consists of galactose (digestible) and mannan (non-digestible) in a 1:1 ratio. Galactose is widely used as a thickening agent in food such as soup, gravies, ice cream and sherbets. As a result, fenugreek may find future markets in functional food and nutraceutical production. An important non spice use for fenugreek is as a potential source of diosgenin. Fenugreek is also known as one of the oldest medicinal plants recognized in recorded history, although debatably.

#### Classification:

Kingdom: Plantae  
Division: Magnoliophyta

Class: Magnoliopsida  
Subclass: Rosidae

Order: Fabales  
Family: Fabaceae

Genus: *Trigonella*  
Species: ***foenum-graecum***

Chromosome number: 2n=16

*Other species: different authorities report varying number of species in this genus. Halevy (1989) has reported as many as 130 species where as Peter et al. (2007) has reported 22 species. Chromosome numbers vary from 2n=16 (e.g. T. foenum graecum) in most of the species to 2n=44 (e.g. T. geminiflora, T. grandiflora (Fedorov, 1974) and T. polycerata) in some of them. Some of the species are even considered weeds and there are still others which have still to be categorically classified. For example Trigonella cretica is also known botanically as Melilotus creticus (L.) Desr, Pocockia cretica (L.) Ser. and Trifolium creticum L.*

*Other major species of this genus are:*

***Trigonella arabica***: Arabian fenugreek, a weedy species in Near East.

***T. procumbens***: An ornamental species also known as trailing fenugreek.

***T. gladiata***: Although some literature cite it as a separate species but others mention it as a sub-species of *T. foenum-graecum*.

***T. ramosa***: Branched fenugreek.

***T. caerulea***: Also known as blue fenugreek, is used as food in the form of young seedlings. This herb is also used in cheese making.

***T. corniculata***: It is used as a potherb (*Kasuri methi*). The fruit is astringent, bitter and styptic. It is applied externally to swellings and bruises.

#### Area and Distribution

Fenugreek is widely cultivated in warm temperate and tropical regions in the Mediterranean, Europe, and Asia. It is largely cultivated in Argentina, Egypt, Brazil, Southern France, Morocco, Algeria, Ethiopia and Lebanon besides India. The major seed producing countries are India, Ethiopia, Egypt and Turkey. India is one of the major producers and exporters of fenugreek. Fenugreek is exported to Saudi Arabia, Japan, Malaysia, USA, UK, Singapore and Sri Lanka. This spice occupies third place in area and fourth in production among all the major seed spices grown in this country. In India, its cultivation is concentrated mainly in Rajasthan. The state has a share of 83 per cent of the total fenugreek production in the country. Other states cultivating fenugreek are Gujarat, Tamil Nadu, Uttar Pradesh,

Himachal Pradesh, Madhya Pradesh, Andhra Pradesh and Punjab.

**Main fenugreek growing District in Rajasthan :** Sikar, Jaipur, Nagaur, Kota, Jhalawar, Baran and Chittorgarh.

#### Domestic Marketing Centres:

Jodhpur, Pratapgarh, Nembhaheda, Bhawanimandi, Jhalrapatan, Ramganjmandi, Sojat, Kota and Jaipur. 8500 metric tonnes of fenugreek was exported during 2006 – 07 while during previous year (2005-06) it was almost double 15,525 metric tonnes. During 2005-06 the Rajasthan state produced 29,173 thousand tonnes of fenugreek seeds from an area of 27,292 hectares followed by Gujarat a distant 5,934 tonnes from 4851 hectares. Uttaranchal, producing a meager 415 tonnes from 261 hectares, has the highest productivity of 1517 kg/ hectare. Fenugreek seeds are an important export item and foreign exchange earner. In 2005-06, 11,852 tonnes of fenugreek seeds, 640 tonnes of powder, 23.1 tonnes of oleoresin and 28.2 tonnes of Kasuri methi seeds were exported to various countries.

#### Botanical Description

Fenugreek is an erect, hardy annual plant, typically growing to a height of 40-75 cm. It has a smooth hollow stem with alternate, single trifoliate leaves, borne on a short petiole with two small stipules at the base, consist of three ovate leaflets, and slightly serrated. Fenugreek plants have a well-developed taproot and a spreading, fibrous root system, carrying numerous small, flattened, much lobbed nodules containing *Rhizobium* spp., usually *Rhizobium meliloti*.

Fenugreek comes in flowering 30 to 50 days after sowing and matures in 105-140 days depending on the variety, climate and other external factors. The flowers are white to whitish-yellow and usually open from 9 a.m. to 6 p.m. with a peak just before midday. Anthesis occurs from about 10.30 a.m. to 5.30 p.m., peaking at noon. The stigma becomes receptive 12 hours prior to flower opening and remains receptive for another 10 hour. Flowering occurs four to five weeks after sowing and continues for up to three weeks. The 60 cm tall stalks almost hide the pea shaped flowers. Fenugreek seed contains little starch or sugar, but a large proportion of dietary fibre. The plant has a sharp, spicy aroma.

### Climatic Requirements

Fenugreek is basically a warm temperate crop with cultivars adapted by long domestication to warmer and colder environment. In warm climate it is usually grown

as a cool season crop whereas in temperate areas as a summer crop. Cloudy weather and high humidity particularly during grain filling period increase the incidence of aphids and powdery mildew, which adversely affect the yield as well as the quality of the produce. Interest in cultivating fenugreek in temperate climates has increased because of its dry land adaptation.

### Adaptation

Because of indeterminate nature of growth, long growing seasons are required for fenugreek. Under cool and moist conditions, plant development is slow. If these conditions prevail during the end of the crop growing season, the plant's indeterminate nature may cause it to fail to mature and immature seeds may be frozen. The plant thrives in full sun on rich, well-drained soils with a pH of 5.3-8.2 and in optimum air temperatures of 8-27°C. Plants grow well with an annual rainfall of 500-700 mm and can survive a moderate moisture deficiency but in case of precipitation above 1250

mm crop faces water logging problem on heavy soils. Growth is slow and weak at cold temperatures and in wet soils. However, it is successfully grown in temperate hills of India where temperatures sometimes go below freezing point.

### Soils

Fenugreek flourishes well on fertile, well-drained loam soils or sandy loams, and grows fairly well on gravelly and sandy soils, but clay soils should be avoided. The acceptable pH range is 5.3-8.2. Moderately saline soils or irrigation water are tolerated, as compared to other leguminous crops with some reduction in herbage or seed yield. A cold and wet soil also favours seed decaying at the time of germination.

### Varieties

Many varieties suited to different agroclimatic zones of the country are available for cultivation. Some improved varieties released and recommended by different institutions in India are mentioned below.

### RMt-1:

This variety was developed by Rajasthan Agricultural University at S.K.N. College of Agriculture, Jobner, through pureline selection in a local collection from Nagaur and released in 1989. The plants are semi erect, tall and moderately branched. The grains are bold with typical yellow colour. The variety is tolerant to root rot and is moderately resistant to powdery mildew disease. It matures in 140-150 days and gives an average seed yield of 14 quintals per hectare. The seed contains 21 per cent protein and diosgenin 0.2 per cent.

### Composition of fenugreek leaves (per 100 grams of edible portion)

Moisture	86.1 grams	Thiamine	0.05 mg
Fat	0.9 grams	Calcium	360 mg
Protein	4.4 grams	Oxalic acid	13 mg
Fibre	1.1 grams	Iron	17.2 mg
Minerals	1.5 grams	Potassium	51 mg
Carbohydrates	6.0 grams	Sulphur	167 mg
Magnesium	67 mg	Vitamin A	6450 I.U.
Phosphorus	51 mg	Nicotinic acid	0.7 mg
Sodium	76.1 mg	Vitamin C	54 mg
Chlorine	165 mg		

Source: Aykord (1963)

**RMt-143:**

This variety was developed by Rajasthan Agricultural University through pureline selection in a local collection from Jodhpur region and identified for release in 1997. The grains of this variety are bold with typical yellow colour. This variety is moderately resistant to powdery mildew. It takes 140-150 days to mature and gives an average yield of 16 quintals per hectare. It is especially suitable for heavier soils of Chittoor region of Andhra Pradesh and Bhilwara, Jhalawar and Jodhpur regions of Rajasthan.

**RMt-303:** This variety matures in 120-125 days and gives an average yield of 18 Q/ha.

**Co-1:**

This is a dual purpose variety released by Tamil Nadu Agricultural University in 1982. The plants of this variety are short and green with medium sized brownish orange seeds. The crop matures in 90 days with a grain yield of 7.5 quintals per hectare. When grown for leaf, the yield is around 9 tonnes per hectare. Because the plants are dwarf and have a short duration, it suits well for intercropping and relay cropping. The seeds contain 20-22 per cent protein while, the leaf contains 15.9 per cent protein. This variety is tolerant to root rot disease.

**Rajendra Kranti (RM-16):**

This variety was developed by Rajendra Agricultural University, Bihar at the Dholi station through mass selection and released in 1987. The plants of this variety are tall and bushy green with medium sized golden yellow seeds. This variety is moderately resistant to powdery mildew, caterpillars and aphids. It matures in 120 days and

gives an average yield of around 12.5 quintals per hectare. Seeds contain 9.5 per cent protein.

**Lam Selection -1:**

It is a selection from the Regional Research Station at Lam, Guntur of N.G. Ranga, Agricultural University through selection from germplasm collected from Madhya Pradesh and released in 1992. The plants are bushy, green with medium sized golden yellow seeds. It is tolerant to root rot, powdery mildew, caterpillars and aphids. It matures in 90 days and gives an average yield of 10 quintals per hectare. The green yield is around 10-12 tonnes per hectare under irrigated conditions. It contains 5.3 per cent of protein in seed.

**HM-103:**

This variety was developed by Haryana Agricultural University through pureline selection from local germplasm and identified for release in 1997. The plants are bushy, semi-erect and grains are bold with attractive yellow colour grains. It matures in 140-150 days and gives an average yield of 20.7 quintals per hectare. It is moderately resistant to leaf spot and root rot diseases.

**Hissar Sonali:**

This variety was developed by Haryana Agricultural University through pureline selection from local germplasm and identified for release in 1993. The plants are bushy, semi erect with bold, yellow attractive grains with 1000 grain weight of 13-15 grams. It matures in 140-150 days and gives an average yield of 17 quintals per hectare. It is moderately resistant to leaf spot and root rot diseases.

**Hissar Suwarna:**

This dual purpose variety

developed by Haryana Agricultural University, Hissar, suitable for cultivation in Haryana, Rajasthan and Gujarat. It gives an average yield of 16 quintals per hectare. It is resistant to *cercospora* leaf spot and moderately resistant to powdery mildew disease.

**Hissar Madhavi:** This variety developed by Haryana Agricultural University, Hissar, suitable for cultivation in both irrigated and rainfed conditions. It gives an average yield of 19 quintals per hectare.

**Hissar Mukta:** This variety developed by Haryana Agricultural University, Hissar. It gives an average yield of 20 quintals per hectare. It is resistant to downy mildew and moderately resistant to powdery mildew disease.

**N.R.C.S.S.-A.M.-1:** The grains of this variety are bold with light bitter taste. This variety matures in 137 days and gives an average yield of 20 quintals per hectare.

**N.R.C.S.S.-A.M.-2:** The grains of this variety are small with strong bitter taste. This variety matures in 137 days and gives an average yield of 18 quintals per hectare.

**Pusa Early Bunching:** This variety matures in 125 days and gives an average yield of 12 quintals per hectare.

**Other improved varieties:** RMt-305, Guj. Methi-1, Methi No. 47, Methi No. 14, HM 57, Prabha (NLM), UM-34.

**Rotations and mixed cropping**

Fenugreek being an annual legume crop can be a very useful and easy to incorporate into short-term rotations. Fenugreek is frequently intercropped with

crops like coriander, sesame, beans and chickpea or sown with lucerne and clover as a mixed fodder crop in India. Mustard is intercropped with fenugreek successfully and aphid population on mustard is controlled with this combination similarly with cole crops like cauliflower (*Brassica oleracea* var. *botrytis*). Crops grown in rotation with fenugreek will benefit from nitrogen fixed by the crop. Crop rotations also have a positive effect on conservation of soil by reducing the chance of depletion of crop-specific micronutrients in the soil, soil erosion and incidence of soil borne pathogens. In addition to soil conservation, crop rotation can reduce the need of fertilizer and insecticide use while reducing weed problems. It should preferably not be grown for more than two successive crops, as the pest and disease build-up is too costly to control.

### Field Preparations

The most important requirement for crop production is as levelled and weed-free a seedbed as possible. One or two deep ploughings or two- three shallow ploughings followed by planking to bring the soil in fine tilth is required. Field should be free from weeds, crop residues and other debris. Field should be levelled appropriately so that it is easy to irrigate.

### Time of Sowing

Last week of October to first week of November is the best time for sowing in Northern parts of India. In no case sowing would be done after 15<sup>th</sup> of November. Late sowing results in attack of insects and diseases and further rise in temperature at maturing time would restrict the yield and

quality. In the southern parts of country it is grown in both *kharif* and *rabi* seasons. In the *kharif* season sowing should be done from the second fortnight of June to the end of July and first fortnight of October is the best sowing time for *rabi* season.

### Seed Rate and Method of sowing

Certified seed of improved varieties should be used for sowing. To achieve optimum plant population a seed rate of 25 kg per hectare is sufficient. Pre-soak of seed for 12 hours in water before sowing to facilitate early and uniform germination. The sowing should be done 30 cm apart in lines with plant to plant distance of 10 cm and seed should be sown not more than 2-3 cm deep. Line sowing is always superior to broadcasting method as line sowing ensures better germination, cuts down seed requirement and facilitates intercultural operations as compared to broadcast method of sowing. To obtain uniform germination optimum soil moisture at sowing time is the prerequisite.

### Seed Treatment

Seed treatment with any systemic fungicide is the first line of defence to control the diseases. Seed should be treated with Thiram/Captan/Bavastin @ two to three grams per one kilo of seeds to protect the crop from seed borne diseases. Fenugreek seed needs to be inoculated with an appropriate *Rhizobium* inoculum to optimize its growth potential while increasing biodiversity in the soil. The Indian soils are generally low to medium in available phosphorus and not more than 30 per cent of applied phosphate is

available to current crop and the remaining part gets converted into relatively unavailable forms. The inoculation of seed with PSB culture plays a vital role in mobilizing of various insoluble inorganic and organic phosphates added to the soil. Therefore, seeds should be treated with *Rhizobium* culture (*Rhizobium meliloti*) and phosphate solubilizing bacteria (PSB) before sowing.

### Nutrient Management

Manures and fertilizers both play an important role in crop production. At the time of field preparation about 10-15 tonnes per hectare farm yard manure or 7.5 tonnes sheep manure or compost should be applied once in three years. Fenugreek being a leguminous crop fulfils the major part of its nitrogen requirement through the process of symbiotic nitrogen fixation which works effectively from three to four weeks after sowing. However, soils with low organic matter and poor in nitrogen supply may require 20-25 kg of nitrogen per ha as starter dose. Application of too much nitrogen can lead to excessive vegetative growth, poor seed production and delayed maturity. Phosphorus is important for root nodule, flower and seed formation and advancing crop maturity. Even though fertilizer should be applied based on soil test and recommendations, a general dose of 25 kg N and 20 kg P<sub>2</sub>O<sub>5</sub>/ha and 20 kg K<sub>2</sub>O should be drilled in the soil at the time of sowing. If soil fertility is high, the dose of nitrogen may be reduced further. If fenugreek is grown in a rotation with crops to which phosphate has been applied, further application is seldom necessary. Fertilizers should be side-banded near the seed or applied with a wider-

spread furrow opener. There is evidence to suggest that application of wheat straw and some strains of fungi (*Sinorhizobium meliloti*, *Trichoderma harzianum*, *Aspergillus niger* and *Chaetoniium globosum*) can promote nodulation, nodule efficiency and plant growth under saline soil conditions. An indication of the nutrient requirement of fenugreek in India is based on the fact that an average seed yield of 1000 kg/ha removes 35 kg N/ha, 18 kg P/ha and 14 kg K/ha (Sadanandan *et al.*, 1998).

### Water Management

Depending upon the climatic conditions, moisture retention capacity of soil and variety used, about five to seven irrigations are required. If moisture is not sufficient in soil a light irrigation should be given just after sowing. To obtain the best results in sandy loam soil, the crop should be irrigated at IW/CPE ratio of 1.00. The first irrigation should be applied at 30 days after sowing, the second at 45-50 days after sowing, the third at 70-75 days after sowing, the fourth at 85-90 days after sowing and the fifth at 105-110 days after sowing. Special care should be taken to avoid water stress at pod and seed development stages.

### Weed Management

Fenugreek seedlings are poor competitors against the often-rampant weed growth and this emphasizes the necessity for a weed-free field, until the taproot is well grown. Flax (*Linum* spp.), canary seed (*Phalaris* spp.) are major weeds. Seeds of these weeds are difficult to separate from fenugreek seeds. *Melilotus* is a designated obnoxious weed in

fenugreek crop. Two to three hoeings and weedings requires keeping the crop well aerated besides keeping it free from weeds. The timing of first hoeing and weeding should be decided on the basis of weed growth but should preferably be delayed until plants are about 10 cm in height. Ideally, it should be done at the time of thinning, which is 25-30 days after sowing and second at 50-60 days after sowing. The herbicides which are very effective in fenugreek are pre plant application of Fluchloralin at the rate of 0.75 kg per hectare supplemented with one hand weeding at 50 days after sowing could keep the crop free from weeds or pre-plant application of pandimethalin @ 1.0 kg *a.i.* can be done safely for chemical control of weeds in fenugreek. In order to obtain the desired results of weedicide application, optimum soil moisture must be maintained.

### SEED PRODUCTION

Fenugreek is a self pollinated crop due to cleistogamous nature of flowers. The flowers are small and extremely difficult to manipulate for artificial emasculation and pollination. Flowers are yellow-white (white flowered types) or sometimes purple-tinged (normal types) and develop in the leaf axils either singly or in pairs. Flowers open around 9 am in the morning.

### Site selection

Field to be used for seed production of **kasuri methi** (*T. corniculata* - a related species) and fenugreek should be free of volunteer plants. In order to ensure this, the crop should be taken on a field on which fenugreek has not been grown in last one year. In order to avoid any

chance of physical admixture, a minimum isolation of 5 meters and 10 meters for certified seeds and foundation seeds, respectively, should be maintained from other varieties or same variety not conforming to certification standards. The fenugreek plants do not cross with Kasuri Methi.

### Inspection and rouging

A minimum of two inspections should be made, first at pre-flowering vegetative stage to confirm isolation, observe uniformity of vegetative characters, took out off-types, diseased plants and obnoxious weeds and the second at the flowering and fruit stage to observe uniformity in flowering, flower characters like colour.

### Specific Requirements

Not more than 0.10 per cent offtypes are permitted for foundation seed crop and 0.20 per cent for certified seed crop at the time of final inspection. Similarly not more than 0.01 per cent objectionable weed plants are permitted for foundation seed crop and 0.020 per cent for certified seed crop. Senji (*Melilotus* spp.) is an objectionable weed for fenugreek seed crop.

### Pods

Pods are slender and sickle-shaped with a sharp beak at the end; green when unripe and turn brown on ripening. They are approximately 7-15 cm long, each containing about 15-20 seeds. The irregular rectangular-shaped seeds are 2.5 to 4 mm long and 1.5 to 2 mm wide and weigh 18-22grams/1000 seeds. The seeds ripen over a period of some weeks making harvesting more

complicated. Plants takes about 16 weeks to mature in warmer climates, probably about 4 weeks longer in cooler climates.

### Seed structure

A deep furrow divides the seed into two parts: the larger cotyledons and the smaller radicle (root tip). Seed coat colour ranges from translucent in white-flowered types, with their colourless endosperm and yellow cotyledons showing through, to greenish brown in normal cultivars. The endosperm of fenugreek seed is a gum that surrounds the cotyledons (seed leaves) and embryo. This gum consists of galactose (digestible) and mannan (non-digestible) in a 1:1 ratio. Fenugreek seeds also contain low concentrations (less than two per cent) of coumarin, diosgenin, saponins and other steroids. These compounds and other constituents give fenugreek products an undesirable taste for some uses. However, debittered fenugreek products are now available.

### Seed Standards

Factor	Foundation	Certified
Pure seed (minimum)	98.0 per cent	98.0 per cent
Inert matter (maximum)	2.0 per cent	2.0 per cent
Other crop seeds (maximum)	10/kg	20/kg
Total weed seeds (maximum)	10/kg	20/kg
Objectionable weed seeds (maximum)	10/kg	5/kg
Other distinguishable varieties (maximum)	2/kg	20/kg
Germination including hard seeds (minimum)	70 per cent	70 per cent
Moisture (maximum)	8.0 per cent	8.0 per cent
For vapour-proof containers (maximum)	6.0 per cent	6.0 per cent

### Crop Protection

#### Diseases

Diseases like leaf spot and powdery mildew, downey mildew, collar rot, root rot have been observed on the fenugreek crop. Normal buff-coloured seed has a much lower level of infection. Therefore, it is suggested that only buff-coloured seed should be used for planting.

**Leaf Spot:** The disease is caused by *Cercospora traverisiana* Sacc. The pathogen is internally seed borne and attacks the leaves, stems, pods and damaging the plants before reaching maturity. It produces purple seed with discoloration on seed coat and results in deterioration in yield (Rastogi *et al*, 1998). The first symptoms usually appear as large spots on leaves and also on stems when disease spreads. Once the young pods get infected the fungus invades the immature seeds. The internally seed borne inoculum did not affect seed germination but caused post emergence losses and transmitted from seed to seedlings

(Rastogi *et al.*, 1998).

**Control:** Seed treatment with any systemic fungicides (Thiram/Captan/Bavastin @ 2-3 grams/kg of seed) is the first line of defence to control the disease. Spraying of fungicides is also useful and gives complete control.

**Powdery Mildew:** Powdery mildew is caused by *Erysiphe polygoni* as well as *Leveillula taurica*. Mildew caused by *Erysiphe polygoni* is characterized by the appearance of white floury patches on both surface of leaves and other parts of the plant. Whereas, mildew caused by *Leveillula taurica* shows mycelium patches on the leaves. Mildew like appearance is due to accumulation of mycelium on the surface of the leaves. Cleistothecia appear on these superficial mycelia at a later stage as small black specks immersed in the mycelial mats. The pathogen *Leveillula taurica* is an obligate parasite, available on the crop residues. It reduces yield as well as grain size and deteriorates the quality. Humid climate and cloudy weather favours the disease development.

#### Control

- 1 Dusting of sulphur powder at the rate of 20-25 kg/hectare.
- 2 Spraying of 0.2 per cent wettable sulphur at the rate of 500-700 litres/ hectare.
- 3 Spraying of 0.1 per cent Karathane LC reduces the damage. Spray or dusting should be repeated after 10-15 days if, required.

**Downey Mildew:** Downey mildew is caused by *Peronospora trigonellae*. Some yellowish spots appear on the upper surface and whitish growth on the lower

surface appears in the initial stage while on advancement of infection, the leaves turn yellow and plant growth is checked. The plant dies if disease attack is severe.

**Control:** Any systemic copper fungicide is effective in controlling this disease. Two to three sprayings of 0.2 per cent solution of Indofil M-45 or Fytolin or Blitox @ 500-700 liter per hectare at an interval of 10-15 days controls the disease.

**Collar Rot:** This disease is caused by *Rhizoctonia solani*. It has been observed to cause severe losses in the nursery. The pathogen causes water soaked lesions at collar region. Rotting of epidermal tissues at collar region due to water soaked lesions causes 'damping off'. As the disease reaches in advance stage the stem becomes constricted at the base and the plants collapse. Initial infection begins from the infested soil as sclerotia of the fungus can survive in the soil for long time. The mycelium grows inside the tissues in all directions, initiating secondary infection and producing sclerotia on the diseased parts.

**Control:** Captan is effective for soil treatment whereas, Brassicol is superior for seed treatment.

**Root Rot:** It is a serious problem in Tamilnadu and Rajasthan. This disease is caused by *Alternaria alternata* (Fr.) *Rhizoctonia fusarium*. This disease is severe under waterlogged conditions. Infected plants show poor development of roots, finer rootlets are destroyed due to rotting. The symptoms appear after the initiation of pod formation. Lower leaves of affected plants gradually lose their green colour and turn pale yellow. The symptoms start from wilting

of leaves and ends with dry and dead plants. Infected plants remain stunted and are easily detached when pulled out.

**Control:** No perfect control measures are available for this disease complex. However, the incidence can be minimized by the following practices.

- 1 Practicing of deep summer ploughing and adoption of proper crop rotation.
- 2 Seed treatment with Thiram/Captan/Bavistin @ two to three grams per kg of seeds.
- 3 Seed treatment with Trichoderma at the rate of four grams per kilo of seed.
- 4 Use of resistant varieties

### Insect Management

**Aphid:** Aphids (*Acyrthosiphon pisum* and *Aphis craccivora*) in general attacks the crop at flowering stage and suck the sap of the plant from tender parts and flowers which affects the growth adversely. With the attack of aphids the crop turns yellow and results in shrivelling of grains leading to yield reduction.

### Termite

To control termites, four liters of chlorpyrifos per ha should be applied with irrigation water.

### Frost

Fenugreek can tolerate frost up to a extent but in severe conditions, damage can be minimized by spraying 0.1 per cent solution of sulphuric acid, irrigating the crop prior to the incidence of frost, using wind breaks and creating smoke cover in the early morning.

### Harvesting, Storage and Handling

Fenugreek grown for seed

should be left in the field until fully mature. Crop becomes ready for harvest in about 105-140 days after sowing when the majority of pods have turned uniform yellowish brown and leaves start falling. Timely harvesting is very important for this crop as late harvest leads to seed losses due to pod bursting, even though pods are normally indehiscent, there is some loss of seed. Under cool & wet conditions at harvesting time, the indeterminate nature of fenugreek can lead to harvest delays and the need to combine at high moisture levels. Harvesting should be done by cutting the plants with sickles and plants are hung upside down to dry in the shade. After harvesting it should be cured for five to seven days in heaps. The heap should be stirred after every two days. Aeration fans in storage sheds should be used to cool and dry the crop. Plants are later threshed manually as convenient, and the residue is suitable for stock-feed. Threshing should be done on clean cemented floor or tarpaulin. The grains are separated by beating by sticks followed by winnowing or by the use of mechanical threshers. In India, fenugreek, grown as a leafy vegetable is harvested by clipping leaves and young shoots, and plants are allowed to grow until mature.

### Processing and storage

After removing the dust and straw, the dried and clean grains are filled in bags and stored in aerated storehouses or in moisture and insect proof bins. On a commercial scale, the grains are cleaned with the help of vacuum gravity separator or spiral gravity separator. The seed should be dried to below 12 per cent moisture for safe storage. Once

dried, the small seed can be easily handled by modern equipment, bagged or transported in bulk. Care must be taken to avoid spoilage in the bin. Fenugreek has been observed to spoil at 15 per cent moisture. To get good prices and easy marketing the produce should be graded and stored properly. Export grading in India is to Agmark standards and PFA regulations, and must also conform to ASTA specifications governing fungal, insect and mammalian contamination.

### Yield

Average yields reported by growers are approximately 15 quintals per hectare. The average yield of fenugreek under dryland conditions is 10-11 quintals per hectare. Under good management conditions and use of high yielding varieties an average yield of 15-20 quintals per hectare can be obtained however, yields have ranged from 15-28 quintals per hectare.

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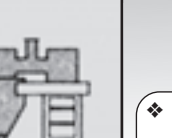
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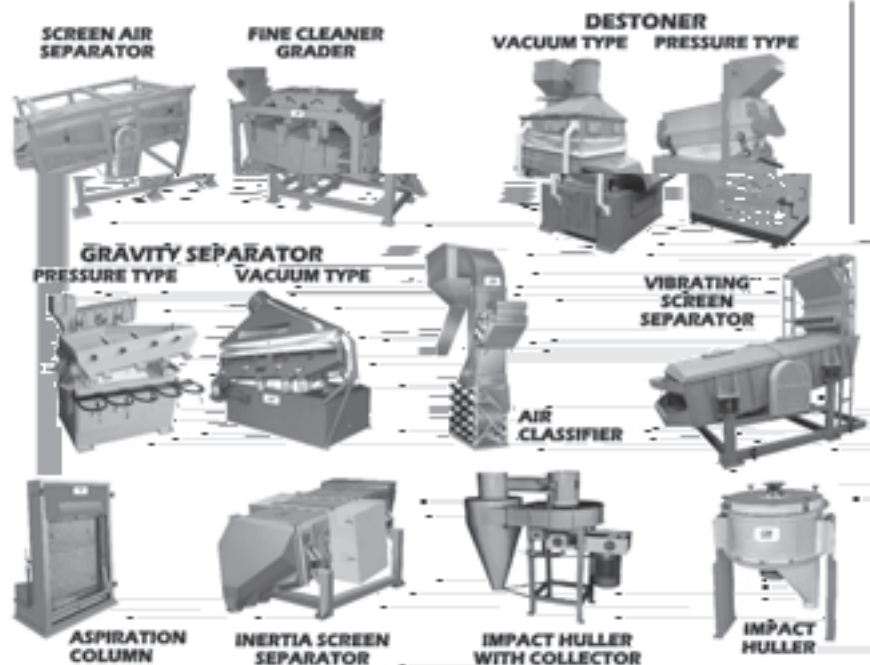
Again he visited Germany & UK in 2003, studied and obtained design and technology of Post Harvest Processing Machineries for Fruits & Vegetables.

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# City of Mosaics MADABA



Mount Nebo's iconic emblem of the cross and Moses' serpent

In Jordan we discovered the ancient *Biblical Lands*.

For forty years, from 1280 to 1240 BC, the Israelites had wandered across the wild and often desert areas of this region, following their charismatic leader Moses, seeking a land that they believed had been promised to them by God. These nomadic exiles eventually produced a vast body of literature which became the world's greatest bestseller: The Old Testament of the Christian Bible.

And in our wanderings across these historic lands we drove into the ancient city of Madaba.

Like much of Jordan, Madaba is built on undulating terrain. Roads wind and climb and descend, gnarled grey-green olive trees spread their shade on old walls, grape vines hang from trellises, and mosques raise their domes near the spires of historic old churches.

When laying the floor of a church in the late 19<sup>th</sup> century, Madaba's greatest artistic treasure

was discovered. In the **Greek Orthodox Church of St. George**, there is a mosaic map of the Holy Land. It was made in the 6<sup>th</sup> century, measures 88 sq meters, and once contained 2.3 million *tesserae* or shaped chips of coloured stone. When it was discovered, it was thought to be the oldest map in the world but apart from its age it also shows, with detailed artistry, what this land must have looked like 1,500 years ago. There is a fish in the Jordan River swimming away from the Dead Sea, horrified at its salinity. Green palms sway over oases. Lions hunt gazelle. Clearly, the land was not as arid then, as it is now. This could explain how the Hebrew migrants survived for forty years in the wilderness. It was, probably, an even greener and much more hospitable land in those distant days after their exodus from slavery in Egypt.

Happily, mosaics last for much longer than paintings, and are far more graphic, because of their colours, than sculptures and



The mosaic creations of saker in his shop in the map bazar

carvings. Mosaics were, also, the preferred surface for floors in those distant days. Stones of many colours were easily available, they were wear resistant and cool in a hot, dry land, they could be cleaned effortlessly, and there was no limit to what they could depict. In fact they were almost as versatile as paintings. And since Madaba was a prosperous town, it soon came to be known as *The Town of Mosaics*. We visited many other examples of this art form that originated in the 6<sup>th</sup>

millennium BC.

In the **Archaeological Museum**, at the end of a small lane, they had conserved a

**Traditional House of Madaba.**

It seemed to be the dwelling of an ordinary middle class citizen but, even so, it had a mosaic design on its floor. In other rooms there were assorted exhibits of costumes and jewellery many of them bearing a striking resemblance to the dress and ornaments worn by some of the colourful tribes of Gujarat and Rajasthan. There was also an open-air display of

sculptures.

The most curious mosaic, however, was in a building that did not look like a church but was identified as

The medallion that dominates the mosaic floor of this structure shows a strange woman rising out of the sea with aquatic animals swirling around her. The original Hebrew name, **Medeba**, ‘water of quiet’, could have referred to an association with a pre-Biblical deity.

There’s a thriving business, in Madaba, and other places, in making mosaics as souvenirs, a profession that has lured Jordanians back from other lands. When *Saker* of **The Map Bazar** learnt that we were from India he asked us if we were from Chennai

**Apostles Church Madaba**

An excavation in 1902 uncovered the name of the church which was constructed in 568 AD. The medallion in the centre of a woman is a personification of the Church. There are scenes of youth and animals on three sides of the acanthus scrolls and in the western and eastern surmounts of the nave.



Madaba’s haret jdouina restaurant very popular with visitors



The church of St. George also known as the church of the map

or Kerala. He had worked in Dubai where he had come across people from those places. He had now returned home to make mosaics for tourists.

We were having lunch in the tree-shaded court of **Haret Jdoudna** .. *The House of our Grandfather*.. restaurant. Here, while enjoying their delectable Arab-Mediterranean cuisine with lashings of salad and food lightly cooked in virgin olive oil, we picked up interesting facts about

the spices they used. Caraway, cumin and cumin are important as are turmeric and fenugreek. Their popular *Tahin* dip is a paste made from sesame seeds and *Yenigahar* is a blend of ground spices fairly close to but not identical with *garam masala*. Other interesting flavourings are rose water and the delightful oil distilled from orange blossoms.

The waiter who brought a swab of orange oil for us to smell asked “Maybe you should export

orange oil from India. No?”

We were still mulling over that when we drove out and parked at the base of **Mount Nebo**. A road wound up, past a turkey and some cocks and hens foraging in the shade of trees lining the route. Further up, in the middle of the road, was a monument to *Pope John Paul II* and, in a clearing in the trees, was a mounted tablet which said:

## MOUNT NEBO Sanctuary of Moses

We trudged along, past a church being restored, up iron stairs and on to a long viewing area. Here stood the famed **Braided Cross** with a sculpture of a snake coiled around it. The cross represented Christ as well as Moses with his arms outstretched, the snake recalled the serpent that Moses had once carried. From here, Moses had been allowed to see the land that he had been forbidden to enter. We looked out from this 800 meter high peak to the distant horizon where Israel’s Jerusalem and Jerico could be faintly discerned.

On May 15, 1948, the United Nations carved out Israel. Some believe that the promise to Moses had been fulfilled. And the world, and the Holy Land, changed.

# WORLD SPICE CONGRESS SKIT TRACEABILITY IN EVERY WAY



A scene from the skit: (from left) Dr.P.S.Sreekantan Thampi, Deputy Director (Publicity), Shri.V.S.Naresh, Assistant Director (Marketing), Shri.S.Palanichamy, Editor, Shri.S.Renganathan, Senior Clerk and Shri. Devananda Shenoy, Assistant Director (Development).

**B**right red and pure white garments. There were caps and head gears and even a sword and a gun. One of them was an apt costume for a Portuguese man, the other a farmer, next a trader and finally the costume for a King and his attendant. Even the make up man with a Marathi moustache was ready on his chair to get his prey metamorphosed. But we were yet to decide who the characters were! The time left for the show was just an hour.

On Feb 10, 2012, the Revel Room of Hotel Westin Koregaon Park in Pune had strikingly contrasting elements in it – computers, pamphlets, documents

and costumes for a drama. The age old proverb says, Actions speak louder than words. No wonder there is so much fascination for movies and theatre even in today's busy life. Here, a serious conference is going on – the World Spice Congress 2012 and the venue is Hotel Westin, Pune. There is not even a single person among the officials who is not busy. But they decided to choose the genre drama to pass on a message related to the theme of the Congress "Sustainability and Food Safety".

Finally the actors were pinpointed. Mr S.Palanichami

,Editor, (as a farmer )– who brought up the idea of doing a skit, Dr P.S.S. Thampi , Deputy Director, ( as grandson of Vasco da Gama), Mr. Devananda Shenoy, Assistant Director,( as trader), Mr VS Naresh, Assistant Director, (as the King) and Mr S.Ranganathan, Senior Clerk (as a courtier). Now that the actors to play the roles were decided they needed to know what they had to do on stage. But none of them could assemble together as all of them were busy with the various assignments of the Congress.

The outline of the skit was anyhow planned and discussed

earlier but the script was not yet ready. There were three girls who were part of the department of Publicity as PR trainees. They constantly got stuffs to write including press releases. This time it is the script for a play. The young minds were thrilled to do the task at hand especially when they heard that the officials from Spices Board were to be seen on stage role-playing characters who were on their mission to spread the theme of the Congress.

They sat together and began, “Darbar of the King His Highness Veerendra Varma. The attendant came running announcing the arrival of a Portuguese visitor to the Palace..” The event manager, Mohan was watching this and he, a veteran in theatre joined them. Powerful dialogues found expression in the paper. Yes, now the script was ready. But a glance at the clock made them panic. It was already 6.30. This has to be staged at 7.00 pm. The main character, Dr. Thampi was nowhere to be seen. The others started changing themselves to the character.

Three of the trainees started explaining the context and the read out the dialogues while the make up man was at work. With cornered eyes and stiff countenance facing the groomer the ‘actors’ obediently listened to the script like children shaping ears to a story. Fifteen minutes left for the performance. Making his presence known Dr. Thampi finally in the Revel Room keeping aside all other matters for the time being. One of the trainees explained the whole story to him. He had the naughty expression as if wild thoughts were roaming around his head which were to be



**The PR trainees, who scripted and sequenced the skit: (From the left) Ms. Revathy S Mohan, Ms.R.Dhanya and Ms.Aneena Mol P.S. along with Dr.P.S.Sreekantan Thampi.**

sputured out soon.

It was done. All the five characters were now in their costumes and they knew the story and the contexts. Whether the performance would be a success was still a question among the spectators who witnessed the 11<sup>th</sup> hour preparation. But the team was quite confident except an unavoidable anxiety as to how it would be like.

We were waiting behind the stage, as a beautiful dance form of Punjab was being performed. We arranged the chairs for the King and the visitor to sit. The funniest part is that we had to borrow the dancers’ costumes to decorate the King’s Chair. Finally, impromptu, it was time to stage the play.

Vasco da Gama’s grandson visits India to attend the World Spice Congress. On seeing the variety of spices and feeling the aroma, he decides to source spices from the local State. The King was informed of his visit by the courtier and as the Gama get escorted to

the Royal court, discussions span on the variety of spices and its qualities. Gama got introduced to a farmer and a trader. Their expressions dismay Gama since they could speak only the local dialect. However the interpretation by the King in English makes the facts clear. The King makes Gama understand about the varieties, value additions, quality certifications and website etc. Gama was not happy with that and insists on identification of farmer and the trader and the processor who handles the merchandise. The King assures that it could be done.

## THE CLIMAX

Moved by the diversity and the colour of India, Gama expresses his desire to marry from India. But the King retorts and ask for his traceability, to ascertain whether he has a wife already in Portugal.



## BOARD SHOWCASES IN BIOFACH NURENBERG, GERMANY

Spices Board became part of Biofach 2012 in Nuremberg in Germany through its unique display during 15-18 February, 2012. Over 2,400 exhibitors showcased their products to over 40,000 trade visitors from 130 countries at this year's BioFach and Vivaness. Austria, Italy, the Netherlands and France made it to the top five countries for visitors in addition to Germany. The assembled organic players at BioFach, the World Organic Trade Fair, and the parallel Vivaness, Trade Fair for Natural Personal Care and Wellness, announced more growth. Despite the financial crisis, BioFach's international patron, the International Federation of Organic Agriculture Movements (IFOAM), and its national supporting organization, Bund Ökologische Lebensmittelwirtschaft (BOLW – German Federation of the Organic Food Industry), assume more market growth in the future.

India was the country of the

year in Biofach 2012. APEDA led the Indian team with a 1100 sq. m pavilion, in hall 5 and 8; fifty one exhibitors showcased the Indian organic sector. Mr. Asit Tripathy, IAS, Managing Director APEDA delivered the inaugural speech on the opening ceremony on 15<sup>th</sup> February 2012. Dr. Ulrich Maly, Lord Mayor of the City of Nuremberg and Dr. Gerd Muller MdB, Parliamentary State Secretary in the Federal Ministry for Food, Agriculture, and consumer protection offered felicitations.

Spices board put up a 45 square meter stall with six exhibitors showcasing the Indian organic spices. Dr. M.R.Sudharshan, Director (Research) and Mr.P. Ravikumar, Senior Field Officer represented Spices Board in the Biofach 2012. There were a number of trade enquiries not only for raw spices but also for oils and oleoresins. Germany imports Indian organic ginger, nutmeg, mace, black

Dr M.R . Sudarshan, Director (Research) ( second right) and Mr Ravikumar, Senior Field Officer (right) of the Board with the visitors at the Biofach show in Nurenberg in Germany.

pepper and white pepper. Lot of interest was shown in the Ayurveda medicines and it is gaining popularity in Germany. Organic spices are used in the natural personal care and wellness preparations. Biofach 2012 had its sister Vivaness a trade fair for natural personal care and wellness preparations.

Besides the exhibition, concurrent sessions were held in Biofach Congress on various topics of current interest. Dr. M.R.Sudharshan, Director (Research) made a presentation on the World of Spices and Spices Boards initiatives in supplying the safe and quality organic spices to the world. Many participants appreciated it.

Besides India as Country of the Year, a trade policy event clearly indicated BioFach's pioneering role for the international market. The USA and EU signed an equivalence agreement on mutual recognition of their organic standards on the first day of the exhibition.

The next Biofach will be held in Nürnberg from 13-16 February 2013.



Mr P.J .Joseph, Hon'ble Minister for Irrigation, Government of Kerala (fifth from left) with the Indian spices contingent at the Spices Board stand in Nurenberg.

# INDIAN BRANDS FOUND CONFINING ONLY TO INDIAN STORES IN JAKARTA

Unlike in the developed economies, there is heavy demand for spices and spices products in countries like Indonesia in the East. The many leading supermarkets in the Indonesian capital of Jakarta have on display on their shelves most of the spices and spices products from Malaysia and China other than that of Indonesia. The very attractive packaging of these products excel the Indian branded spices which are seen only in the Indian supermarkets in the town.

The Indian brands aim at selling only through the Indian supermarkets while the competing brands from other countries find their brands positioned in supermarkets all over. A study of the market outlets was done by the officers of the Spices Board, Dr. Dinesh Singh Bisht, Scientist B, New Delhi and Mr. P.T. Lepcha, Senior Field Officer, Sikkim during their stay in Jakarta during 6 to 8 March 2012 in connection with the participation of the Board in Made in India show in Jakarta. The supermarkets like Lotte Mart at Ratu Plaza Senayan, South Jakarta, Hero at Sarinah, central Jakarta and Ah Jnan, South Jakarta had on their shelves spices products packed in the US with bar coding. Local companies like Merbaba, Mint Samba, McCormicks also had their due share in the shelf space.

The India show held at the Balai Kartini Convention Center



**Mr. Anand Sharma, Union Commerce and Industry Minister [left] and H.E Mr. Gita Irawan Wirjawan, Minister of Trade, Indonesia being greeted at the Spices Board stand.**



**Dr Dinesh Singh Bisht [left] in conversation with a visitor at the stand**

was declared open jointly by the Union Minister for Commerce and Industry, Mr. Anand Sharma and H.E Mr. Gita Irawan Wirjawan, Minister of Trade, Indonesia. Both the Ministers were received at the Spices Board stand with a traditional scarf from Sikkim. Mr Anand Sharma explained about the Spices Board to the Indonesian

Minister. The Indian Ambassador to Indonesia, Mr. Biren Nanda, Mr. Rakesh Kumar Arora, First Secretary (Economy & Commerce) and Mr Ajit B. Chavan, Deputy Secretary, Ministry of Commerce & Industry visited the stand.

There are production bases in Indonesia who are looking for opportunities to export spices



Mr. P.T. Lepcha with visitors at the India show.

products from Indonesia to India. There were enquiries for cumin and ginger powder.

Mr. Deepak Malik, (Owner of The Royal Kitchen, Indian restaurant & Bar) visited Spices Board's stall and informed us that they are using Indian spices only and wanted to promote Indian spices.

## MANGAN: MASTER TRAINING PROGRAMME ON LARGE CARDAMOM



Shri. B M Jayaram, Deputy Director (Dev), Spices Board, Gangtok, is seen addressing in the Master training programme on large cardamom held on 20<sup>th</sup> Maarch 2012 at Mangan in North Sikkim..Shri. M Y Honnur, Assistant Director, Spices Board, Mangan, Shri. T P Bhutia, Joint Director Horticulture and CCD, North Sikkim, Dr. U Gupta, Deputy Director(Res), ICRI, Tadong, Shri. P. P Kanel, Assistant Director (Mktg), Rangpoo, Shri. Navaraj Gurung, B B F and Shri. S R Bhutia, D D Hort & CCD, N Sikkim are also seen.



A view of officers attending the training.

## REGIONAL SEMINAR : ELAPPARA



Smt.E.S.Bijimol, M.L.A. Peermade, Idukki District is seen inaugurating the Regional Seminar on Spices organized by the Regional Office in Puttady and Zonal Office in Kumily on 1<sup>st</sup> February 2012 at Elappara. This event was organized by Ms.Vijeeshna V.Senior Field Officer, Spices Board, Elappara.



A view of farmers attending the seminar.

# FAQS AT FOODEX TOKYO POINT TO QUALITY ASSURANCES IN SPICES EXPORTS

It is not the lack of awareness of Indian spices that is detarding export growth to Japan. The interactions with business visitors at the Foodex 2012 in Tokyo in Japan held during March 6 to 9, 2012 has definite focus directed towards the responsibility of the exporter in assuring lot of guarantees right from the post harvest to processing end. Many senior Japanese businessmen who visited the pavilion could interact with the Indian participants in the stand. Strikingly there were underscoring the need of the Indian companies to have own processing facilities since quality could be assured only through own production lines. Merchant exporters may not be able to fare well in the coming years in a market like Japan which is getting more and more sophisticated.

The Spices Board stand had a wide area for its participation in Foodex this time with an impressive pavilion of nearly 55



**Chef Yoshiko Imazato serving food to the visitors and getting their feed back.**

square meters with an inbuilt kitchen from where spices based dishes were prepared, explained and served to the visitors. Chef Yoshiko Imazato of Cafe Topinamkour of Kunitachi, Tokyo did her master pieces and demonstrated cooking of a wide range of Japanese delicacies wherein spices were applied by

way of introducing spicy feels. Dishes like Carrot rice with cumin, fried rice with takana pickle and turmeric, couscous and orange salad with cinnamon dressing, pepper onata with spices, marinated cherry tomato with fenugreek, elingi mushroom and spinach saute au brown mustard seed, curried brown lentil burger with spicy salsa etc were served hot. There was a bee line of visitors who expressed their happy comments with a relishing note.

The trademen who made up to the stand were looking for quality packing materials besides spices of assured quality.

Some of the FAQs from the visitors are:

1. How many Indian spices exporting companies have own factories
2. What are the assurances that companies could give in terms



**Visitors have all praise for Indian spices. Visitors with the officials of the Board**

of procurement and processing.

3. What is the assurance in terms of pesticide usage in spices during growing.
4. Whether joint production facility could be set up
5. Capability in supplying spices and spices products in attractive bottles with value added PoPs.

The Spices Board stand had individual stands of M/s DK Enterprises of Hyderabad, M/s Aricha of Kolkatta, M/s Evergreen of Mumbai and M/s Sartaj of Jodhpur who had happy times meeting with visitors to their own stand positions in the Spices Board pavilion. The Spices Board



**Dr P.S.Sreekantan Thampi, Deputy Director [ middle], Mr Jijesh Das, Deputy Director of the Board with Mr. Radhakrishna of DK Enterprises,**

officials Dr PS Sreekantan Thampi, Deputy Director and Mr. Jijesh Das, Deputy Director EDP were busy meeting visitors and coordinating the programmes at the show.

## SPICES BOARD REGIONAL QUALITY EVALUATION LABORATORIES START MICROBIOLOGICAL ANALYSIS

Spices Board's Regional Quality Evaluation Laboratories in Chennai, Guntur, and Mumbai, have started the analytical services for the following Microbiological parameters.

1. *Salmonella*
2. *E.Coli*
3. *Coliforms*
4. *Yeast and Mold*
5. *Total plate count*

The analytical charges and the other details can be downloaded from the Board's website **www.indianspices.com**. The samples may be sent directly to the Laboratories along with the analytical charges.

Exporters those who want to avail the facility may contact the following telephone numbers and e.mails of the labs.

<b>Place</b>	<b>Tel. number</b>	<b>E.mail</b>
Chennai	044-27923450	sbrochennai@gmail.com
Cochin	0484-2349134	sbqlkochi@gmail.com
Guntur	0863-2338571/ 2338569	sbrognt@sify.com
Mumbai	022-2784 3093	sbromumbai@gmail.com

# SPICES BOARD PARTICIPATES IN INDIA TRADE SHOW 2012 MEXICO

Spices Board participated in India Trade Show 2012 organized by the India Trade Promotion Organisation (ITPO), New Delhi during 28<sup>th</sup> February to 02<sup>nd</sup> March 2012 in Centro Benamax, Mexico City, Mexico. The Trade Show was inaugurated by Engr. Carlose Gustaman, President, Promexico, the counterpart of CII, on 28<sup>th</sup> February 2012. Shri Dinesh Kumar Jain, Ambassador of India in Mexico delivered key note address. ITPO had organized the Indian Show in Mexico for the first time and the main focus of the show was to introduce Indian Culture, Handicrafts and Textile Industries to the Mexico. ITPO had organized Indian cultural programmes every day.

The stall of the Board festooned with beautiful panels and different samples of Indian spices attracted the visitors. A Food Show was also arranged in



**Shri Dinesh Kumar Jain, Ambassador of India in Mexico at the Spices Board stand trying the curry spice mix prepared for tasting at the stand.**

Board's stall jointly by the Board and M/s Synthite Chemicals, Kolencherry through their counterpart M/s Piasa Mexico who had introduced a new Indi-Mex flavour/seasoning with the spice oils and oleoresins. Samples of the cooked food using the mixes were given away to visitors for tasting. The visitors to the stall

included businessmen from Flavouring, Wine industries, food importers, brokers, Professors from Universities, Lawyers, Freight forwarders, Students besides the local Indian communities. Considerable business enquiries were also received which shows that Mexico is a potential market for many of



**From left: Mr Bright Thomas and Mr Ajay of Synthite Industries, Kolencherry, Mr Daniel Rodriguez, Director Food Service of Piasa Mexico, Mr N Anilkumar and Mrs Ajitha Kumari, Assistant Directors of Spices Board and Ms Claudia M Alvarez Elizondo of Piasa at the Spices Board stand.**

our Indian spices.

Shri Dinesh kumar Jain, Ambassador of India in Mexico and other officials from the Embassy, from Promexico and ITPO visited Board's stall. Board's participation in the show could generate awareness among Mexicans about Indian spices and

Spices Board. The added advantage for the Spices Board was that other Indian companies participated in the show and who have trade contact with Mexico were also eager to assess the market for Indian spices there. Smt. M.B.Ajitha Kumari, Assistant Director (Mktg.) and

Shri N. Anilkumar, Assistant Director (OL) organized the participation of the Board in the show. M/s Synthite Industrial Chemicals, Kolencherry and M/s PSS Krishnamoorthy Exports, Tuticorin participated in the show through Board's stall.

## EXHIBITIONS: CALICUT KRISHI JALAKAM



Farmers from Vijayawada in Andhra Pradesh visiting the Board's stall organized in connection with the Krishi Jalakam exhibition held at Indian Institute of Spices Research, Calicut held from 16<sup>th</sup> to 17<sup>th</sup> February 2012.

## GUWAHATI NORTH EAST REGIONAL AGRICULTURE FAIR 2012



Shri. B.D. Sarma, Senior Field Officer and Shri.B.J.Brahma, Deputy Director (Dev), Spices Board are seen interacting with the visitors at the Board's stall during North East Regional Agriculture Fair 2012 held from 10 to 12 February 2012 at Guwahati.

## SHRI.V.J. XAVIER HONOURED


Shri.V.J Xavier, an employee of Spices Board, Cochin weight has been honoured in various power lifting competitions held both in State and National level Power lifting Federations. He got third place in the 66 kg weight class at the Kerala State Masters Powerlifting Championship held at Police Auditorium, Kannur on December 2011. He secured First place in Hard Core organized by Ernakulam District Powerlifting Championship held at Ernakulam Gym on


December 2011. Shri.Xavier also participated in the Master National Powerlifting championship held at Chandrapur during January 2012 and ranked fourth. The latest weight lifted was 342.5 kilo grams. (Body weight 59 kg)

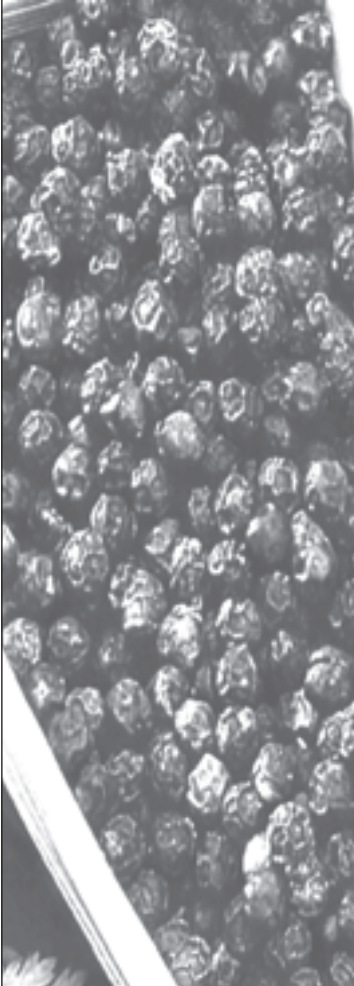






# CALENDAR OF OPERATIONS FOR IMPORTANT SPICES - MAY 2012

Timely planning and execution of farm operations based on agro climatic conditions of the area is important for successful farming for higher productivity and sustainability. To facilitate this a calendar of operations in respect of important spice crops for May is given below:

Name of the crop/ Type of operations	Details of operations to be carried out
<p><b>SMALL CARDAMOM</b> I Agronomic measures</p> 	<p><b>NURSERY</b></p> <ul style="list-style-type: none"> <li>➤ Regular watering may be given to bed/polybag/ sucker nursery based on necessity.</li> <li>➤ To control damping off/seedling rot diseases in nursery, soil drenching with 0.2 per cent copper oxychloride or 0.2 per cent mancozeb may be taken up.</li> <li>➤ As bio-control measure, Trichoderma or Pseudomonas or Bacillus species may be applied in the soil.</li> <li>➤ For controlling leaf rot disease, spray 0.3 per cent mancozeb and for controlling leaf spots, spray 0.25 per cent difoltalan or 0.2 per cent bavistin after noticing early symptoms.</li> </ul> <p><b>MAIN FIELD</b></p> <ul style="list-style-type: none"> <li>➤ In densely shaded areas, regulate the shade selectively to provide more sunlight during monsoon period. It may be about 60 per cent of filtered sunlight for better performance.</li> <li>➤ Likewise in open patches planting of shade tree saplings like Cedrella toona (Chandana viambu), Vernonia oxbergia (Karuna), Jack can be done to reduce the problems of root grub proliferation and better performance of cardamom.</li> <li>➤ During the end of May or early June, after the receipt of sufficient summer showers, planting of seedlings/clones can be started in the main field. Planting in a cloudy day with intermittent drizzling is very ideal for cardamom for its better establishment.</li> <li>➤ After planting, stake the plants with stick and mulch the plant base with dried leaves or weeded materials.</li> <li>➤ Always ensure that no water logging is there at the base of the plants, by providing better drainage.</li> <li>➤ Just prior to monsoon showers, trashing operation may be completed and make all the panicles be above the mulch materials.</li> <li>➤ Application of first round manure for irrigated areas can be done, after getting one or two good showers at the end of May or early June. This may be done with 90 kg. urea, 207 kg. rock phosphate and 137 kg. muriate of potash/ha.(1/3<sup>rd</sup> dose of 125:125:250 NPK per hectare per year.</li> <li>➤ For rainfed areas, apply @ 81 kg. urea, 187 kg. mussoriphos and 125 kg. muriate of potash as first round(1/2 of 75:75:150 kg NPK hectare per year.</li> </ul>

	<ul style="list-style-type: none"> <li>➤ The above two recommendations are made only if no soil test recommendations are available. If available, apply based on soil test results only.</li> <li>➤ The said inorganic fertilizers may be applied along with any one of the organic manures like FYM or compost 5 kg or neem cake one to two kg per plant in 20 cm wide circular band about 30-40 cm away from the plant base.</li> <li>➤ In the case of young plants, 1/3<sup>rd</sup> and 2/3<sup>rd</sup> of the recommended dose of the fertilizer may be applied for 1<sup>st</sup> and 2<sup>nd</sup> year respectively.</li> </ul>
II. Pest management	<ul style="list-style-type: none"> <li>➤ For Integrated Pest Management prune dry leaves without removing green leaf sheath.</li> <li>➤ Apply quinalphos @ 200 ml per 100 liters of water (spray may coincide shoot borer moth emergence).</li> </ul>
III. Disease management	<p><b>MAIN FIELD</b></p> <ul style="list-style-type: none"> <li>➤ Provide adequate drainage if water stagnation is noticed.</li> <li>➤ Integrated Disease Management against azhukal and rhizome rot in severely affected areas, phytosanitary measures and application of fungicides/bio-control agents may be taken up.</li> <li>➤ COC (0.2 per cent), drenching + one per cent bordeaux mixture spray. 15 days later apply trichoderma alone or with pseudomonas fluorescens at plant base. Repeat bio agent application and foliar spray with Akomin 0.4 per cent.</li> <li>➤ If bio-control measure is followed, basal application of Trichoderma harzianum alone or with pseudomonas fluorescens is recommended.</li> <li>➤ Katte infected plants if found must be rouged and destroyed.</li> </ul>
<p><b>LARGE CARDAMOM</b> I Agronomic measures</p> 	<p><b>Nursery</b></p> <ul style="list-style-type: none"> <li>➤ Disease/pest infected suckers may be removed</li> <li>➤ Each and every large cardamom farmer is necessary to raise his own large cardamom nursery for planting in his field at least 500 meters away from large cardamom field.</li> <li>➤ Regular watering and weeding may be continued in the existing sucker nursery.</li> <li>➤ Nursery site meant for sucker multiplication may be cleaned by removing all the weeds; debris and soil may be brought to fine tilth.</li> <li>➤ Trenches of 45 cm width and 30 cm depth may be opened at convenient length with an interspace of 30 cm well decomposed cattle manure or compost may be mixed with the soil and the trenches are filled. Disease free, high yielding, one grown up shoot with an emerging bud may be planted at 45 cms apart in the trenches during May-June, and then the base may be mulched with forest leaves. To support the suckers, bamboo/wooden stakes may be provided.</li> </ul> <p><b>Plantations</b></p> <ul style="list-style-type: none"> <li>➤ One round weeding may be attended for easy movement of wild bees for better pollination and fruit setting.</li> <li>➤ The large cardamom fields may be visited regularly and chirkey/foorkey etc. diseased plants may be uprooted and destroyed by burning/burial in the soil.</li> </ul>

	<ul style="list-style-type: none"> <li>➤ For replanting/gap filling, the site may be cleared by removing all old &amp; diseased plants and by clearing all weeds and debris.</li> <li>➤ Pits of 30 x 30 x 30 cms may be opened at a spacing of 1.5 x 1.5 meter on the receipt of rains and then the pits are to be filled with top soil/compost/cow dung etc.</li> <li>➤ The planting materials may be selected from high yielding sucker nurseries, free from pest &amp; diseases for replanting/gap filling.</li> <li>➤ Suitable shade tree saplings may be selected and used for planting in the areas where the shade is less and to protect from hail storm damage.</li> <li>➤ Application of cattle manures/organic manures/fertilizers to cardamom fields will help in getting sustained production, improving productivity and better quality of the crop.</li> <li>➤ Application of one per cent bordeaux mixture to the cardamom plants will help to control the fungal diseases before the one set of rains.</li> </ul>
<p><b>PEPPER</b> I Agronomic measures</p> 	<p>Nursery</p> <ul style="list-style-type: none"> <li>➤ Watering may be continued in the nursery based on necessity.</li> <li>➤ Shade may be reduced in the nursery on receipt of one or two good summer showers.</li> </ul> <p>Main field:</p> <ul style="list-style-type: none"> <li>➤ Shade regulation may be done to reduce the shade intensity just at the onset of monsoon showers.</li> <li>➤ On receipt of good showers, the shade protection given to young vines may also be removed.</li> <li>➤ Planting of standards for new planting may also be done now.</li> <li>➤ Apply farm yard manure or compost @ 10 kg per vine.</li> <li>➤ In areas where liming is not done last season, lime @ 600 grams per vine may also be applied around the plant basin separately.</li> <li>➤ For controlling phytophthora foot rot, phytosanitary measures, biological control measures and chemical control measures may be taken up.</li> <li>➤ Application of trichoderma harzianum and pseudomonas fluorescens would help in reducing intensity of the disease.</li> <li>➤ Addition of organic mulches and oil cakes in the basins improves the texture of the soil and enhances the growth of antagonistic micro organisms.</li> <li>➤ If chemical control is resorted to, any one of the following can be adopted:1) After the receipt of few monsoon showers all the vines are to be drenched with COC 0.2 per cent @ 5 to 10 liters per vine. Foliar spray with one per cent bordeaux mixture.2) Drenching with Potassium Phosphonate 0.3 per cent@ 5 to 10 liters per vine. Foliar spray with 0.03 per cent potassium phosphonate.3) Drenching with metalaxyl mancozeb 0.125 per cent @ 5 to 10 liters per vine and foliar spray with same concentration.</li> <li>➤ In case bio-control agents are applied only aerial sprays with chemicals is to be resorted and soil drenching should be avoided.</li> </ul>
<p><b>VANILLA</b></p> 	<p>Main field:</p> <ul style="list-style-type: none"> <li>➤ Continue irrigation based on necessity, if monsoon rain delays.</li> <li>➤ Apply vermicompost @ one kg per vine or farm yard manure or compost @ two kg per vine in the base of the vine and then cover with mulch materials like weed wastes or shade tree loppings and other plant residues.</li> </ul>

	<ul style="list-style-type: none"> <li>➤ If still flowering observed, continue pollination between 6.00 am to 12 noon with skilled labours.</li> <li>➤ Prophylactic spray with one per cent Bordeaux mixture may be given or two per cent spray with Pseudomonas sp. (in Talc base) (two kg in 100 liters of water) or one per cent spray with Pseudomonas sp. (in liquid culture) available at ICRI, Myladumpara, may be given.</li> </ul>
<p><b>GINGER</b></p> 	<ul style="list-style-type: none"> <li>➤ Weeding may be done based on necessity.</li> <li>➤ After 40 days from the date of basal dressing top dressing with 80 kg of urea has to be done per hectare .</li> <li>➤ Earth up the beds after top dressing of fertilizer.</li> <li>➤ Repeat the mulching of beds with green leaves/weeded materials @ tonnes per hectare.</li> </ul>
<p><b>TURMERIC</b></p> 	<ul style="list-style-type: none"> <li>➤ Weeding may be done based on necessity.</li> <li>➤ After 40 days from the date of basal dressing, top dressing with 65 kg of urea has to be done per hectare.</li> <li>➤ Earth up the beds after top dressing of fertilizer.</li> <li>➤ Repeat the mulching of beds with green leaves/weeded materials @ five tonnes per hectare.</li> </ul>
<p><b>CHILLI</b></p> 	<ul style="list-style-type: none"> <li>➤ On completion of harvesting green manuring can be practiced by sowing pulse crops (pillipesara, cowpea or sunhemp) in the land proposed for next season cultivation.</li> <li>➤ Wherever chilli is intercropped with cotton, dried chilli and cotton plants (after harvest are to be uprooted and cut into small pieces and incorporated into the soil for enhancing the fertility and water holding capacity of the soil).</li> <li>➤ If needed soil testing can be taken up during the month.</li> </ul>

## KALIMPONG: KISAN MELA



A view of visitors in the Board's stall and interaction with pepper growers



Shri Narayan Samata, Additional Director of Agriculture, NorthBengal, Government of West Bengal keenly seeing the spices displayed in the Spices Board stall in the Kisan Mela exhibition organized by CPCRI-Regional Station at Mohit Nagar in Jalpaiguri District of West Bengal. Also seen are : Shri B M Jayaram, Deputy Director [Dev], Spices Board and Dr U Gupta, Deputy Director [Res], ICRI, Sikkim.

## MONTHLY AVERAGE PRICES OF SPICES FOR MARCH 2012

SPICE	CENTRE	GRADE	PRICE ₹/KG
Black Pepper	Kochi	Ungarbled	384.23
		Garbled	399.23
Cardamom small	Vandanmettu/ Bodinayakanur	bulk e-auction	828.51
	Siliguri	Badadana	748.50
Siliguri		Chotadana	664.00
Chillies	Virudhunagar		-
	Guntur		52.10
Ginger(Dry)	Kochi	Best (New)	77.00
	Kochi	Medium (Old)	87.50
Turmeric	Kochi	Nadan	57.30
		Salem	50.80
		Agmark	51.30
		Erode	47.80
Coriander	Chennai	Rajasthan Green	54.50
	Chennai	Deluxe	45.30
	Chennai	Ordinary	139.10
Fennel	Chennai	-	86.00
Fenugreek	Chennai	-	33.90
Mustard	Chennai	Small	46.70
Garlic	Chennai	Medium	15.20
Clove	Cochin	-	921.48
Nutmeg(with shell)	Cochin	-	416.30
Nutmeg(without shell)	Cochin	-	757.59
Mace	Cochin	-	1311.11

Prices are collected from secondary sources like Agricultural Produce Market committees, Kirana Merchants Association, India Pepper and Spice Trade Association, 'Spices Review' from chhaganlal kalidas mehta, Licensed Cardamom Auctioneers etc.

<b>ALL INDIA CARDAMOM AUCTION SALES AND PRICES FOR MARCH 2012 COMPARED WITH MARCH 2011</b>				
PERIOD	MARCH 2012		MARCH 2011	
	Quantity sold (Kg)	Average price (₹/Kg)	Quantity sold (Kg)	Average price (₹/Kg)
First week	466531	760.59	144575	970.47
Second week	372466	738.27	217368	1048.94
Third week	526124	888.73	242167	992.06
Fourth week	433404	884.04	219960	980.68
Fifth week	120266	907.98	105730	910.01
<b>Total</b>	<b>1918791</b>	<b>828.51</b>	<b>929800</b>	<b>989.98</b>

Source: Auction reports received from licensed cardamom Auctioneers

## AVERAGE INTERNATIONAL SPOT PRICES FOR MARCH 2012

SPICE	MARKET	GRADE	(USD/KG)	(₹/KG)
Black Pepper	U.S.A	MG-1	7.81	393.00
White Pepper	U.S.A	Muntok	10.69	537.92
Cardamom(Small)	Saudi Arabia	India Asta Extra Bold	22.06	1110.00
Chillies	U.S.A	India S4	3.20	161.02
		Chinese Small	3.86	194.24
Ginger(Dry)	U.S.A	Indian	3.86	194.24
Turmeric	U.S.A	AFT 5..25 Curcumin	5.20	261.66
Coriander	U.S.A	Canadian	1.39	69.94
Cumin	U.S.A	Syrian/Indian	3.77	189.71
Fennel		Egyptian fancy	2.82	141.90
Fennugreek	U.S.A	Ind/Turkey	1.10	55.35
Clove	U.S.A	Mad/Zan/Com	17.99	905.26

Exchange Rate 1 US \$ = ₹ 50.32

SOURCE:M/s.A.A. SAYIA & CO.INC HOBOKEN



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