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April 2009

## Quality Appeal to Farmers





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# SPICE INDIA

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TO THE PROMOTION OF  
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## IN APRIL ISSUE

CHILLIES AND SEEDS SPICES QUALITY APPEAL CAMPAIGNS IN ANDHRA PRADESH, GUJARAT AND RAJASTHAN Dr. P.S. Sreekantan Thampi	4
HEALTH BENEFITS OF SPICES Dr. K.N.Pushpakumari and S. Pramod	10
BOMMI SUPERIOR- AN INNOVATION OF A CARDAMOM GROWER/OR A NEW CARDAMOM VARIETY P. Ravi Kumar	17
NUTMEG - SEX-NUTS ! B.Sasikumar	21
LANGKAWI Hugh & Colleen Gantzer	23
FERTIGATION STUDIES IN GARLIC V. Sankar, K.E Lawande and P.C. Tripathi	27
EVENTS	30
CALENDAR OF OPERATIONS FOR IMPORTANT SPICES-MAY 2009	37
SPICES STATISTICS-MARCH 2009	42

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# Chillies and seed spices Quality appeal campaigns in Andhra Pradesh, Gujarat and Rajasthan

**T**he place of the farmer in the country's export of farm products is supreme. It is he who produces the commodity for exports, assures consistency in supplies, processes through the best methods and readies the product meeting the basic standards for the market.

The changing trends in the international trade and commerce and the resultant change over in the import regulations and quality standards, expectations of the buyer etc are known only to the exporter. The farmer who produces these products are totally unaware of these changes. But it is certain that the farmer also gets the feel of these so that commodity of

quality could be produced with confidence. Many of the spices that India grow and export find easy markets internationally. But it is not that easy these days on account of stiff global competition. The short cut to win competition is to raise the quality of the product exported. With this in view the Spices Board has taken up a programme to reach the farmer in their growing tracts. The campaign highlighted the slogan "Clean spices for better prices". During the months of February and March, field publicity campaigns were organized in the major spices growing tracts in Andhra Pradesh, Gujarat and Rajasthan. Meeting thousands of farmers, the campaign officials interacted with farmers,

farm labourers and communicated to them the necessity to stick to scientific post harvest practices to get rid of contamination and infestations. It was an experience gaining exercise in a way for it helped in gathering the live styles and the problems of the farmers.

The farmers in general are aware of the requirements but they find it difficult to implement the steps required in their environments. Lack of facilities and poor infrastructure deter them. They look forward for support in laying out cemented yards and polythene sheets for drying produces, facilities for storage and introduction to the real buyer. The expectation of the farmers...the campaign could feel their pulse.





# CAMPAIGN ON AFLATOXIN IN CHILLIES IN GUNTUR VILLAGES IN ANDHRA PRADESH

Campaign on aflatoxin in chillies initiated by the Spices Board has got off to a start on 18th Feb in Thullur Mandal in Guntur district of Andhra Pradesh. The campaign covered the major chilli growing villages in Guntur district viz; the villages of Thullur, Nekkallu, 75/Tyallur, Peda Kurupadu, Batluru, Lagadapadu and Rajupalem.

Former Principal Scientist of the RARS Lam, Guntur, Dr. Khalid Ahamed exhorted the farmers in the campaign on the necessity to observe quality measures. The campaign meetings were held in the villages in the evening hours to facilitate attendance of farmers. The meeting was followed by screening of film on aflatoxin in chillies. Literature on quality maintenance and on



A view of the farmer crowd attending the meeting.

aflatoxin issues were circulated in the villages. The campaign team consisting of Spices Board officials met farmers in the villages to know their problems. The campaign team consisted of Joint Director, Mr HC Chandrasekhar, Deputy Director Publicity, Dr. P.S.S. Thampi, Asst Director Official Languages, Dr. G. Usharani, Hindi Translator, Mr Biju Shenoy, Senior Field Officer, Mr



Dr. Khalid Ahmed, former Principal Scientist of Lam Guntur speaking at the aflatoxin campaign in Thullur Mandal. Seen on the dias are [from right] Mr H.C. Chandrasekhar, Joint Director, Spices Board, Guntur, Progressive Farmer, Sri N Krishna Rao and Dr. P.S.S. Thampi, Deputy Director [Publicity].

A.C Girish Kumar, Field Officer, Ms Sani George.

Meetings were held Thulluru Mandal Headquarters, Nekkallu, 75 Tyallur, Pedakurapadu, Batluru, Lagadapadu and Rajupalem



A chilli field in Rajupalem in Guntur district ready for harvest



# SEED SPICES: CAMPAIGN TO TRIGGER QUALITY AWARENESS IN GUJARAT



**Farmers at the Amarpura village in Patan Taluk taking interest in viewing the Board's Gujarathi film on processing of seed spices.**

Lalpur village of Sami Taluk in Patan district of Gujarat is hot, sandy, dry and dusty. But still it has many things to take pride of when compared to other villages that are blessed otherwise. Located close to the Kutch desert and the Indo Pak border, the village has very little water source at depth below 600 to 700 ft and that too salty. However the hardworking villagers make their living out of growing good quality cumin, fennel, dill, fenugreek and bishop's weed. Almost all the farmers have an equally important vocation in cow and sheep rearing. Milk production is equally important like that of production of a variety of seed spices. Water is scarce but milk in plenty on account of intensive rearing of cow and buffaloes. Cow and buffalo dung are found in large heaps kept for spreading in the fields while the next season of sowing starts. Gobar gas is used profusely in many of

the homes for cooking. Bank, post office, police station and hospitals are kilometers away. This is the scenario in many of the villages where seed spices are grown. Farmers are generally illiterate and they take on farming by practice and experience. It is from Lalpur that the Spices Board started the new field publicity campaign for seed spices to educate the farmers on hygiene and cleanliness in processing of seed spices on Monday, 23<sup>rd</sup> March 2009.

The first meeting in the village was attended by over 100 spice farmers who for the first time listened to the necessity to undertake prescribed practices to ensure cleanliness and hygiene in seed spices produced by them. The farmers who listened to the presentations on the topic interacted at the end. The reactions of the farmers hovered around topics like making available



**Deputy Director [Publicity] Dr. P.S.S. Thampi addressing the farmers at Lalpur in Sami Taluk, while Mr Krithi Kumar J Amin [right], President of the Pradesh Kisan Vikas Sangha translates.**



**Farmers at Agimana village under Patan Taluk attending the campaign meeting.**

technical and back up support for drip irrigation in their seed spice farms, expert advise on plant care, on organic farming etc. For the cleaning and processing of the produce, polythene sheets were sought. The meeting was presided over by Mr Ramesh Bhai Patel, General Secretary of Pradesh Kisan Vikas Sangh. Deputy Director of the Board, Dr. P.S.Sreekantan Thampi explained the need for scientific post harvest practices in the light of the present day stringent measures imposed by international buyers of seed spices. Mr Kirti Kumar J Amin, President of the Sangh exhorted the farmers to adopt the steps suggested for achieving quality produce. Mr. Sakthabhai Bhawal, President of the Milk Producers Service Society, Lalpur and Mr Raionalji, Serpanch of the village participated in the deliberations. Board's Assistant Director Official Languages, Dr. G. Usha Rani and Hindi Translator, Mr Biju Shenoy interacted with the farmers.

The second meeting was held at Adiya in Hariz taluk in Patan district which grows cumin, dill seed, mustard etc. The programme had a gathering of around 75 farmers who assembled at the High school building in the village. Mr Mulchand Bhai Patel, a retired banker and a progressive farmer moderated the proceedings

of the programme which was addressed by the Deputy Director [Publicity ] of the Board. Board's Assistant Director Official Languages interacted with the farmers. Farmers were looking for periodic advices from experts on growing and processing. They wanted to improve the quality for a better market deal. Presentations on organic cultivation and its prospects, direct linkages with exporters were subjects of interest for the farmers.

The third meeting was held in the village of Chendalaj in Sidhpur taluk on 25<sup>th</sup> March attended by around 100 farmers. Assistant Director Official Languages, Dr. Usha Rani explained the dos and don'ts in processing. Farmers interacted well. The Serpanch of the Village, Mr. Kantilal, attended the meeting.

The fourth meeting was held in Agimana village under Patan Taluk. As part of the campaign the Board's team met farmers in unofficial gatherings of around thirty to forty farmers in the villages of Amarpura and Untavada in Patan Taluk. Video film on processing and the CD prepared on the do's and don'ts in Gujarati language on processing by farmers were played.

An informal interaction with the media in



**Assistant Director [Official Languages] of the Board Dr. G. Usha Rani addressing the farmers at Agimana village.**



Patan on 22<sup>nd</sup> March helped in generating publicity for the campaign in the district on the Spices Board's quality initiatives and the campaign. The meetings in the villages helped in outlining the need for the improved post harvest operations, the scope for getting better prices through high quality produce besides the scope for organic production. Audio visual aids, distribution of literature in Gujarathi language and interaction with farmers helped in reaching the message of the quality campaign besides sending word about the activities of the Spices Board.

The official team visited the APMC market yard at Patan and had interacted with traders and officials of the market yard. They sought details of the activities of the Board. It was desired to have a meeting of growers and exporters with officials and technical experts in the market yard either in April or August.

The farmers in general liked to have the following:

1. Details of the schemes of the Spices Board
2. Technology on water management.
3. Package of practices with

recommendations to avoid using banned pesticides and insecticides.

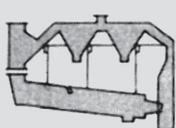
4. Technical advise on weeds, diseases besides on application of chemical fertilizers.
5. Training on post harvest operations.
6. Village level storage facilities on scientific basis.
7. Guidelines on organic cultivation.
8. Interface with exporters and processors.
9. Silpaulin or polythene sheets to dry seed spices.





**HI-TECH**

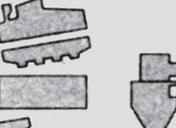
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# CLEAN SEED SPICES: CAMPAIGN ENDS IN RAJASTHAN



**Dr. Gajendra Sharma of IRAD addressing farmers at the meeting held in Nevra (Assistant Director, Jaipur, Mr. Sopal Ram is also seen (second from right)**



**Farmers at the meeting held at Bara Khala**

The campaign to motivate farmers to produce clean and quality seed spices organised by the Spices Board in four villages in Jodhpur district of Rajasthan ended on 1st April 2009. The programme was held in the remote villages of Bara Kurdh, Bara Khala, Nevra and Pandithji Ki Tani in the Hosian subdivision of Jodhpur district. The villages covered in the campaign come under the organic seed spice farming project of the Board which is currently in progress. The meetings held in the evening hours were well attended by farm-

ers in the villages. Dr. Gajendra Sharma of IRAD, Dr. P.S.S. Thampi, Deputy Director [Publicity], Mr Sopal Ram, Assistant Director [Jaipur], Dr. G. Usharani, Assistant Director [Official Languages], Mr Biju Shenoy [Translator] of the Board interacted with the farmers at the meeting and during the day hours in the farms.

The harvesting and thrashing of cumin and dill were in progress in the farms at this point of time.

The farmers have expressed their inability to store their harvested produces for want of proper warehousing facilities, real buyers and non availability of quality tarpaulin sheets to dry their produces after harvest. Water for irrigation is a major hurdle in the villages which are otherwise well looked after by the villagers to maintain the eco system. Birds like parrots, peacocks, snakes, deer and rare plant species peculiar of the desert land like babool, keyar and neem are found in abundance decorating the vast expanse of this desert land. The villages which were covered by the campaign are mainly growing cumin and celery of high quality.



**Farmers at Bara Kurdh participating in discussions at the meeting.**

**Dr. P.S. Sreekantan Thampi**  
Deputy Director (Publicity)



# HEALTH BENEFITS OF SPICES

Dr. K.N.Pushpakumari \* and S. Pramod  
AVT Natural Products Ltd.  
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## Black Pepper

Pepper, the universal spice, named as the “King of Spices”, is the fruit of *piper nigrum*, a tropical vine, belonging to the family piperaceae, which

iron and other minerals. So it is not surprising that the world’s best pepper comes from this region—Tellicherry pepper, which is grown north of Kochi and Malabar pepper, once

Indonesia, Cambodia, Vietnam, Sri Lanka, Brazil and West Africa.

Generally, pepper is identified by its port of export or the region where it is grown. ‘Lampung’, a commercially important pungent black pepper is grown in the Lampung province of Sumatra and in a few other areas of Indonesia. Two well-known types come from India’s Malabar Coast: Malabar pepper and Tellicherry pepper. Tellicherry is a higher-grade pepper, made from the largest, ripest berries from Malabar plants grown on Mount Tellicherry.(2) ‘Sarawak’ pepper is grown in Sarawak State in Malaysia, along the northwestern coast of Borneo. ‘Brazilian’ pepper is produced in the State of Para on the Amazon River. Brazil was the first country in the western hemisphere to produce pepper on a commercial scale. ‘Vietnam’ pepper is now extensively traded though it is only recently that Vietnam has



flourishes in a narrow, 15-degree band around the equator, in places where the sun is hot and monsoons can bring over 100 inches of rain per year. Black pepper is native to South India and is extensively cultivated in south India and other tropical countries.

Pepper happens to grow best in the kind of soil along India’s Malabar coast—a loamy, red “laterite” soil produced by the decaying rock, laden with

known as Alleppy pepper, which is grown to the south. Along the coast, vines in homestead plots clamber up the trunks of palm and eucalyptus trees. In the inland valleys, it is cultivated in commercial plantations and in the high hills, pepper can be found under shade trees, merrily growing alongside coffee, tea and cardamom at elevations of 3,000 feet(1) .

Commercial sources are India, Malaysia, Singapore,

S P I C E I N D I A





become a major producer of pepper(3)

Black peppercorns are plucked when the berries have grown to full size, but are still green. Traditionally, they are laid out on woven mats to dry in the hot sun, although some growers now use kilns. Blackening of pepper berries happens due to the enzymatic oxidation of polyphenolic substrates present in the skin of green berries. (4) The phenolics in pepper are a mixture of phenolic glycosides and flavanol glycosides. On hydrolysis phenolic acids comprising of hydroxyl benzoic acids and hydroxyl cinnamic acids along with quercetin and kaempferol were formed .(5)



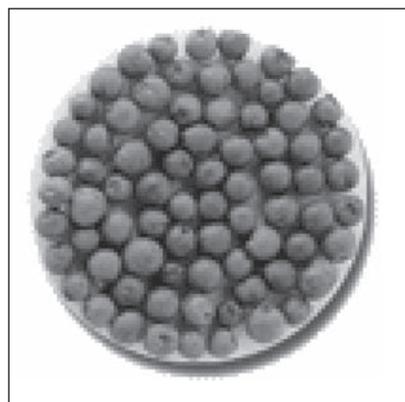
**Black and white pepper corns**

White peppercorns are produced by leaving the berries on the vine until they are fully ripened, turning to deep pink or red—a risky procedure, since untimely rain or too much sun can ruin the crop. The ripe berries are then packed into burlap bags and placed in cool

running water for one to two weeks. After the outer shell softens and separates from the hard inner core, the peppercorns are rubbed and washed until the pericarp comes off, then are dried either in the sun or in kilns. Either way the resulting peppercorn is pale in color—not white, but shades of cream or beige—and hot in flavor, since all traces of the blackening enzyme and the aromatic pericarp have been removed. Also mechanical decortication of the pericarp or enzymatic processing is also used for producing white pepper. White pepper produced by the traditional method will have a peculiar fermented odour, which is valued by some foreign countries. ‘Muntok’ is the most important variety of white pepper grown in the island of Bangka and exported through Pangkalpinang, a port on the southeastern coast of Sumatra. ‘Brazilian’ white pepper is lighter and less pungent than ‘Muntok’

Green peppercorns are unripe berries which are harvested as soon as they reach their mature size. To keep them from turning black, they are either soaked and packed in brine, or immersed in boiling water for 15 minutes and dried in the sun. Either way, the blackening enzyme is destroyed and the peppercorns keep their

pale green color and characteristic “fresh” green flavor. Green peppercorns are available dried or packed in brine. Freeze dried green peppercorns, which plump up in liquid, can be used whole in cooking (6) .



**Green Pepper**

**Composition of dried black pepper berries:**

Dried berries of black pepper constitutes 28- 49 per cent starch, 8.7-18 per cent crude fibre, 1.55 – 2.6 per cent total nitrogen, 4.4 – 12 per cent alcohol extractives, 0.3 -4.2 per cent volatile ether extractives, 3.9 – 11.5 per cent non-volatile ether extractives, 2.8 – 9 per cent piperine, 3.6 – 5.7 per cent total ash, 0.03 – 0.55 per cent acid insoluble ash and 8-14 per cent moisture.(7) Starch is the predominant component in pepper. Fat content in pepper berries varies from 1.9 – 9 per cent (8) and the composition of the fatty oil was studied by



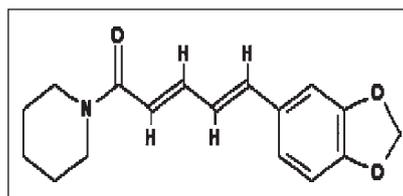
Sazler as palmitic (16-30 per cent), oleic (18-29 per cent), linoleic (25- 35 per cent) and linolenic acid (8-19 per cent) (9). Recently Parmer et al listed the following miscellaneous constituents in pepper, acetyl choline, caffeic acid, capric acid, choline, p- coumaric acid, p and m- cresol, 2(3, 4- dihydroxy phenyl) ethanol, henriacontane, henriacontane - 16-ol, henriacontane - 16 -one, lauric acid, melvalic acid, 3,4 methylene dioxy cinnamaldehyde, myristic acid, oleic acid, palmitic acid, phenyl acetic acid piperonal, stearic acid, sterulic acid and varnolic acid(10)

Black pepper's aroma comes from the volatile oil. The aroma is released when pepper is cracked or ground. *This is the reason that smart cooks only buy whole peppercorns and grind them as needed.* Pepper gets its spicy heat mostly from the alkaloid, piperine, which is found both in the outer fruit and in the seed. The outer fruit layer, left on black pepper, also contains important odour-contributing terpenes including pinene, sabinene, limonene, beta caryophyllene, and linalool, which give citrus, woody, and floral notes. These scents are mostly missing in white pepper, which is stripped of the fruit layer. White pepper can gain some different odours

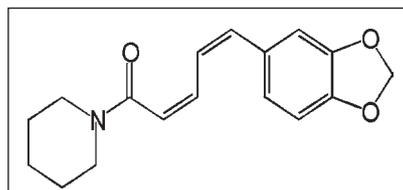
(including musty notes) from its longer fermentation stage(3). The pungency is attributed to the presence of piperine, but more recent studies reveal that several other related alkaloids like chavicine, isochavicine, isopiperine, piperitine, piperanine, piperylin, piperolein A and pipeoroline B, also contribute to the pungency to varying extents(11).

**Piperine** : Molecular formula C<sub>17</sub>H<sub>19</sub>O<sub>3</sub>; Molecular Weight - 285.34;

Melting point - 128-132 deg C; CAS No : 94 - 62 - 2



Pepper loses flavour and aroma through evaporation, so airtight storage helps preserve pepper's original spiciness longer. Pepper can also lose flavour when exposed to light, which can transform piperine into nearly tasteless isochavicine(3). Piperine has trans configuration at 2 and 4 positions, while chavicine is the cis form and isochavicine is 2 trans and 4 cis.



Chavicine

Volatile oil in black pepper ranges from 1.5-4.5per cent depending on the variety and geographical origin. Components in the volatile oil and their percentages also vary with origin. The most abundant compounds in pepper oil are beta -caryophyllene, limonene, beta -pinene, delta -3-carene, sabinene, alpha -pinene, eugenol, terpinen-4-ol, beta -eudesmol and caryophyllene oxide. The oil from ground black pepper contained more monoterpenes and less sesquiterpenes and oxygenated terpenoids as compared to green and white pepper oils. After 1 year of storage of pepper samples in a glass vessel at room temperature, the amount of the oils isolated decreased, the content of terpenes decreased, and the amount of oxygenated terpenoids increased.(12)

### Health Benefits of Black Pepper

Black Pepper and long pepper (*Piper longum* L.) are both important medicinal herbs in Ayurvedic and Unani (traditional Indian) medicine systems, in which remedies generally consist of mixtures of herbs. A wide range of the medicinal uses of black pepper have been documented by Kirtikar and Basu(13), including its use in the treatment of leucoderma. Black pepper has



also been implicated as a possible adjunct to *Vernonia anthelmintica* in the treatment of leucoderma(14). The two herbs- pepper and long pepper are employed as a constituent in many traditional herbal preparations for a variety of uses, including gastro-intestinal and skin ailments. Compositions comprising black pepper, ginger and pipali have been used in the treatment of vitiligo(15) ; however the specific therapeutic action of black pepper in this orally administered composition has not been established.

The use of black pepper as a healing spice was written about as far back as the 5th century in the Syriac Book of Medicines. Other less harmful uses include its use in treatment for insect bites, insomnia, liver problems, gangrene, hernia, lung disease, heart disease, liver problems, sunburn, and toothaches(3).

Black pepper has long been recognized as a carminative, a substance that prevent the formation of intestinal gas, a property likely due to its beneficial effect of stimulating hydrochloric acid production. In addition, black pepper has diaphoretic( promotes sweating) and diuretic (promotes urination) properties. Black pepper stimulates the taste buds in such

a way that an alert is sent to the stomach to increase hydrochloric acid secretion, there by increasing digestion. Hydrochloric acid is necessary for digestion of proteins and other food components in the stomach. When the body's production of hydrochloric acid is insufficient, food remains in the stomach for longer period of time, leading to indigestion, or may pass into the intestines, where it is used as a food source for unfriendly gut bacteria, whose activities produce gas, irritation and causing diarrhoea and constipation. Thus pepper helps to treat ailments like gas, heartburn, nausea, diarrhoea and constipation.(16)

But the health benefits of pepper are not limited to digestive malaise. It is a "warming" spice and helps enhance the effects of other herbs throughout the body. It is also said to help enhance circulation and get oxygen to the brain. In addition, it may help keep your joints and respiratory system healthy.

Black pepper has been demonstrated to have impressive anti-oxidant and anti-bacterial effects. The antioxidant property of black pepper prevents and curtails oxidative stress. Moreover, several of these compounds work indirectly by enhancing

the action of other antioxidants. Black pepper also reduces the damage caused by a diet full of saturated fats which is found to be the main cause of oxidative stress and prevents bacterial growth in the intestinal tract.

Piperine inhibits some of the pro-inflammatory cytokines that are produced by tumour cells, there by interfering with the signalling mechanisms between cancer cells, thereby reducing the chances of tumour progression.

The outer layer of peppercorn stimulates the breakdown of fat cells, keeping you slim while providing you with energy.

**Hence, black pepper is not merely a spice. To prevent the risks of cancer, oxidative stress, and intestinal gas troubles and improve your digestion, all you need to do is add some amount of black pepper in your food.**

**The important healing properties of pepper are listed below:(17,18)**

Black pepper induces sweating, which consequently cools down the body and relieves feverish symptoms.

It improves circulation and promotes mental clarity.

It can help clear up colds, viral infections and flu when taken as tea.



Black pepper helps to prevent gas and flatulence and induces urination.

Black pepper is a powerful anti-oxidant and antibacterial, which was useful for meat preservation before the time of refrigerators.

Black pepper helps to break down and digest fats and meat proteins much more easily, as it induces the production of saliva and gastric juices needed for digestion in the stomach.

Black pepper is a good source of manganese and iron, which are important for the body to function correctly.

Components of black pepper are often added to mouthwashes and gargles used to treat sore throats.

Black pepper is a stimulant that can stimulate various parts of the body such as the heart, kidneys and the stomach.

When foods are consumed with black pepper, the body is able to absorb valuable vitamins and nutrients from the food much easier.

Black pepper has been used to treat fatigue and tiredness, it stimulates the appetite and has been used to treat anorexics and people with eating disorders.

A strong black pepper and mint tea will help clear chest and lung infections and bring

up unwanted mucous and phlegm.

### **Medicinal Properties of Piperine**

Piperine has shown potent chemoprotective effect against procarcinogens.(19) The extracts of *Piper nigrum* are found to have a hypercoagulative effect *in vitro.*, they lessen the clotting time by accelerating the thrombin activation and lowering the heparin level in the clotting systems (20) and valued for rubefacient properties and hence used as local application for sore throat, piles and some skin diseases.(5) and found to be potential in the treatment of vitiligo as it helps increase pigmentation in the skin.(21)

Anti-metastatic activity of piperine was demonstrated by clinical trials on mice by Kuttan et al from Amla Cancer Research Centre, Trichur.(22)

Piperine increases the bioavailability of valuable phytochemicals present in other spices and can boost the activity of biochemically active compounds contained in green tea, curcumin and a variety of other spices by up to several fold, depending on the molecule concerned. It does this via two principal mechanisms. First, it promotes the rapid

absorption of certain chemicals from the gastrointestinal tract, protecting them from being broken down by chemicals in the intestinal lumen and by enzymes that occur in the cells lining the intestines. Secondly, once the compound has entered the blood stream, piperine provides protection against oxidative damage by liver enzymes. In this way black pepper enables to reap optimum benefits from the medicinal phytochemicals found in other dietary spices.(23) It has been shown that piperine can dramatically increase absorption of selenium, vitamin B and beta-carotene as well as other nutrients.

Several studies reveal that piperine increases the bioavailability of nutrients(24-26) and drugs(27-30). It inhibits several enzymes responsible for metabolizing nutritional substances, stimulates amino-acid transporters in the intestinal lining, inhibits removal of substances from cells so they continue to be available for use, and decreases the intestinal activity allowing more of the substances to enter the body in active form. The results of these actions are that substances reach, enter and remain within their target cells for longer periods of time than would normally be the case. Piperine can turn a marginally



effective therapeutic substance into a highly effective one by increasing its bioavailability and intracellular residency time. As an example, piperine can increase the bioavailability of the cancer, inflammation and infection fighter, curcumin, by twenty-fold.

In addition to its effects on bioavailability, piperine has many other actions in the body that include increasing beta-endorphins in the brain, acting as an anti-depressant, increasing serotonin production, boosting brain functioning, stimulating adrenal production, relieving pain and asthma symptoms, stimulating melanin production, decreasing ulcerations of the stomach and coordinating digestive tract contractions. It is highly effective against colon cancer.

Sabinsa Corporation received U.S. patent 6,849,645 and UK patent no. GB2380675 for the invention titled "Method of increased bioavailability of nutrients and pharmaceutical preparations with tetrahydropiperine and its analogues and derivatives."

Tetrahydropiperine is a derivative of piperine. The patent describes novel applications of this ingredient to enhance the bioavailability of nutrients, drugs and other

active compounds. According to the company, when formulated with tetrahydropiperine, poorly absorbable active compounds such as curcumin are better absorbed through the skin and gastrointestinal tract.

Sabinsa has also developed a branded ingredient cosmoperine for use in cosmetic formulations to enhance the bioavailability of topically applied active compounds.

**Bioavailability enhancing properties makes black pepper one of the most important spices. It should be added to recipes and meals as often as possible as it boosts the medicinal value of many spices and other foods.**

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## BOMMI SUPERIOR- AN INNOVATION OF A CARDAMOM FARMER

**Sri. Murugan with his Bommi Superior cardamom plant**

**M**egamalai hills in Tamil Nadu is an ideal location for cardamom cultivation with elevation ranging from 750 - 1200 meters MSL. A hamlet called Bommarajapuram, in Megamalai hills is 60 km away from Theni on the way to Vellimalai estates. It lies in the lower elevation under the influence of North East monsoon. Most of the inhabitants are marginal and small cardamom and coffee farmers. Malabar variety of cardamom is predominantly cultivated in this area. Some of the elite farmers have switched

over to high yielding Njallani cultivar, but performance of this introduced cultivar is not pronounced because of the lack of congenial climatic condition and timely cultural operations as done by the farmers of Idukki district, Kerala state.

Sri Ramaiah, a veteran in cardamom cultivation is a third generation farmer possessing 1.1 hectares of cardamom field. During 1999-2000 he was awarded second prize by Spices Board for obtaining second highest productivity in India. The field is

**P. Ravi Kumar**  
Field Officer  
Spices Board  
Bodinayakanur

predominantly with Malabar cultivar and some vazhukka plants. Sri Murugan son of Shri.Ramaiah possessing 4.25 hectares of cardamom land noticed a Malabar type of clump with exceptionally bold, dark green capsules with higher yield compared to the adjoining plants in the year 2000-01. This clump was put under surveillance by his family members for the yield and incidence of pest and disease. In the subsequent year also, this



**Local**

clump performed well without decline in yield and lesser incidence pest and disease. In 2002-03 he collected the seeds and raised a polybag nursery as per the norms of the Spices Board. During 2003-04 he planted 200 plants in a 0.2 hectare which is now under yield with high productivity and less incidence of pest and disease. The capsules are dark green in colour and he termed it as Patchakai (Green capsules). To commemorate the place of origin the cultivar is christened as BOMMI SUPERIOR. Unlike other varieties, the colour of the capsules did not fade out even after a year.

### Nursery

As cardamom is a cross pollinated crop, in recent years in order to get uniform planting material in a short span of time sucker / rhizome multiplication is adopted. But this particular type of plant is raised from



**Patchaikai**

seeds only. The capsules were uniform, bold and green with more number of seeds compared to other varieties. Seed capsules for raising nursery were collected from third and fourth rounds of harvest. Seeds were extracted from the selected capsules, after removing the mucilage, and sown in primary beds and transplanted to the polythene bags in August. The transplanted seedlings were kept in open to hasten tillering (see photo). On receipt of north east monsoon, the seedlings were planted to the pits.

### Planting and aftercare

The area proposed for (re)planting was cleared off the jungle growth, and sufficient shade trees were maintained. Planting was done on terraced benches at a distance of 10 feet between plants and rows. Pits of 2 1/2 x 2 1/2 x 3 feet dimension were dug out two to

three months in advance of planting. Top soil was kept aside for pit filling (see photo). Planting may be done either in June or in October / November (on the receipt of North east monsoon). The pits were filled with trash collected from the field, a basket full of composed cow dung mixed with top soil. When the pits are ready the plants may be planted. This plant showed a good establishment in the field and there was no casualty. Three months after planting the total number of tillers produced were 32, whereas in any other cultivar less than five tillers were produced for the same period. Similarly, cardamom planted during June 2007 produced 88 tillers with 22 panicles (see photo) whereas in other varieties number of tillers was less than 20 for the same period. Sprinkler irrigation was



**Patchaikai - 5**



given throughout the year except during the monsoon period. Shade was regulated when the wind velocity was minimum ( September / October ). Earthing up of the basin was done twice a year , the first immediately after harvest and the second during September/ October after removing the old leaves.

### Manuring

Irrespective of age of the plant fertilizer was applied twice in a year. When the newly planted plants put forth two-three tillers or two months after planting 150 grams each of Di Ammonium Phosphate ( DAP) and powdered neem cake were mixed well and applied as a circular band around the basin of the plants and then irrigated. The second round of application was given six months after planting with the above ingredients @ 200 grams each per plant.

For the matured plants after weeding , 25 kg each of Di Ammonium Phosphate ( DAP) and powdered neem cake were mixed with water and made upto 200 liters and fermented for a day. 2-3 litre This supernatant solution was sprayed to the plants twice a year @ two to three liters. The first application may be in June and second one in October/ November.

In addition to the above , for

the high yielding plants. Di Ammonium Phosphate 0.5 per cent ( 1 kg of DAP in 200 liters of water ) was soaked and kept overnight. Supernatant solution was diluted with water in 1:1 ratio. This solution was sprinkled to the plant @ two litres per clump. This was done twice a year usually during rainy season to avoid scorching of the leaves.

### Pest and disease

During the visit to the field no major pest or disease was noticed. Stray incidence of thrips damage was noticed. Incidence of stem borer was not at all noticed. In order to save the crop from ravage of pests six-eight rounds of insecticides were sprayed at 30-40 days interval with any one of the insecticides Quinalphos and Monocrotophos alternatively. During summer period ( Jan/ Feb) Monocrotophos spray was found to be effective against thrips. Proper care was taken not to repeat the same insecticide for the subsequent sprays. In Bommarajapuram area incidence of azhukal is not common . In this field, fungicidal sprays had not been given so far from planting. During the visit only one clump was seen affected by azhukal.

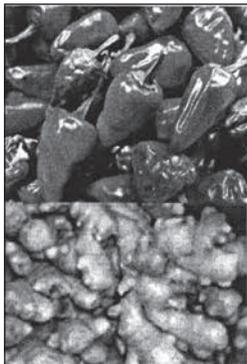
(Advised them to give two rounds of spray with Copperoxy chloride @0.3 per cent during pre monsoon season and after a month.

### Yield

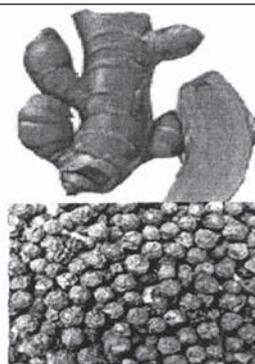
Maiden crop was noticed 18 months after planting. Full bearing was noticed on the third year of planting. In the four year old field 8-10 rounds were harvested in a year. Peak harvest was obtained from 3rd to 6th harvest( 4 rounds ), from each harvest 500 grams of dried capsules were obtained in a plant . Harvest made during the early and late phase ( 4 rounds) yielded only 200grams of dried capsules per plant. In all 2.8 kg of dried cardamom was obtained. In a hectare of 1000 plants, about 2000 kg of dried cardamom is expected. In the fifth year after planting , economic yield is expected for three - five more years depending on the management of the field. As cardamom yield is consistent for the past three in the above field , neighboring farmers have shown keen interest and introduced this cardamom in their field.

It is quite evident from the experience of Shri. Murugan that his selection Bommi superior is yielding higher with less inputs and minimal management over the traditional cultivars. This variety may be introduced in areas where the North East monsoon is pronounced especially in Tamil Nadu and other areas with similar climatic and edaphic conditions.





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S P I C E I N D I A





# NUTMEG SEX-NUTS!

**'N**utmeg sex,nuts Doc.!' quipped the 70 yr.old, tall, black Mr.Borchel Clarke, Hosroro, Region#1,Guyana when told about the sexual dimorphism in nutmeg. Initially the lean farmer could not believe that there is male and female sexes in nutmeg. And later on when explained to him that some of

his non bearing trees are simply males he came round and realized that what the Indian guy is telling is not nuts but a 'loose connection' to be tightened with nuts and bolts! .Finally he got convinced that 'man tree' is a reality in nutmeg as he has seen

in Papaya!(Male trees are 'man trees' in the local parlance!)

(The old man was more delighted when told that the sexually dimorphic spice is also good for SEX as some alleged viagra like properties are now attributed to nutmeg!)

**B.Sasikumar**  
**ITEC Expert (Spices Technology)**  
National Agricultural Research Institute  
Mon Repos,Guyana  
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Yes, ignorance galore in Guyana about nutmeg.

Nutmeg,though an ideal crop for the country,lack of awareness about the value of the spice and its cultivation practices are major limiting factors at present in the country for this tree spice. Farmers and general public think that the mace is not of value! The existence of sexual dimorphism in the tree and the method of grafting to circumvent the sex problem are not heard of by the farmers!

Currently efforts are under way to lay a foundation for scientific nutmeg production in the country besides creating awareness among the people about the spice. Germplasm



Fig 1. An elite nutmeg tree



**Fig2. Close up of a matured fruit showing the mace**

variability in nutmeg, seedlings are raised from seeds procured from Grenada. Variability is noticed in the population for the nursery performance (Fig3).

### **Epicotyl grafting**

Using the elite mother tree in Region #1 as source of scion, epicotyl grafting to produce female trees is now underway. Young seedlings raised from seeds procured from Grenada are used as root stocks. The seeds take 3-6 months for germination. Grafting success of about 40 per cent could be achieved.

survey, exploitation of seedling variability and epicotyl grafting are initiated now in the country.

### **Germplasm survey**

A germplasm survey conducted recently revealed that nutmeg is grown in only Region #1, out of the 10 regions in the country. This hinterland region bordering Venezuela in the west is inhabited mainly by Amerindians, the ethnic people. A total of 33 trees between two farmers could be seen. Though the trees are left uncared, one tree of approximately 30 yrs old owned by Mr. B. Clarke, Hosrora, Region #1 appears to be an elite tree. Characterised by medium canopy (Fig1), it produces on an average 7000

fruits per year. The fruits are medium sized with cream coloured pericarp. The mace is scarlet coloured, whole and thick (Fig2)). Nut is medium bold.

It is told the tree is derived from seedlings supplied by the Ministry of Agriculture, Guyana long ago, probably from the seeds obtained from Grenada.

### **Open pollinated progeny selection**

In order to exploit the seedling



**Fig 3. Seedlings (10 month old) variability in nutmeg**





Langkawi's emblem : The brown brahmminy kite in eagle square

**I**t has everything going for it. It's an island: not too little, not too big. It's in Malaysia: a country that continues to offer great travel deals to Indians. And the whole island is a duty-free haven. The name of this

happy destination is **Langkawi**.

We caught a ferry from Kuala Perlis.. For 45 minutes we sat in comfortable aircraft-style seats and, when we were racing across the bay, saw a Bollywood film in which Salman Khan

### Hugh & Colleen Gantzer

removed his shirt. *Applause!* We disembarked at the ferry terminal with the ambiance of an international airport and an enormous sculpted eagle dominating **Eagle Square**.

The roads were good, as most Malaysian roads are, and it all feels a bit like Kerala or Goa. There's a wide range of hotels and most people you are likely to interact with will speak English. Malaysian food has been described as a sort of fusion of Indian and Chinese cuisine but that's not doing it justice. As in our own land, various regions have their own specialities from curry puffs through biryani to fried chicken wings. They use spices with discretion and, happily, most of them are imported from our land and sold in shops dominated by expats from Tamil Nadu and Kerala.

Searching for things to do we headed for the **Oriental Village** on Batau Bay. It's a beautifully landscaped leisure complex with restaurants, shops and activities centres but its major attraction is its two-stage cable-car ride. The cars swing out over densely forested valleys and mountain slopes to the high peak of **Mount Mat Cincang**, in two stages. The eagle-eye views from the cars are spectacular; there are even



**A beautiful dwelling in the memorial to Mahsuri**

more breath-taking ones from the mid-station and the top station. We stopped off at the mid-station and went walk-about along a stepped path through a tropical forest and then ventured out onto a dramatic sky-bridge that spanned a gorge between two peaks. Unlike most bridges it curves like the wing of a giant bird, the wind whips up and around, and you keep getting a tingling buzz of adrenalin with ever step you take. It's a heady feeling.

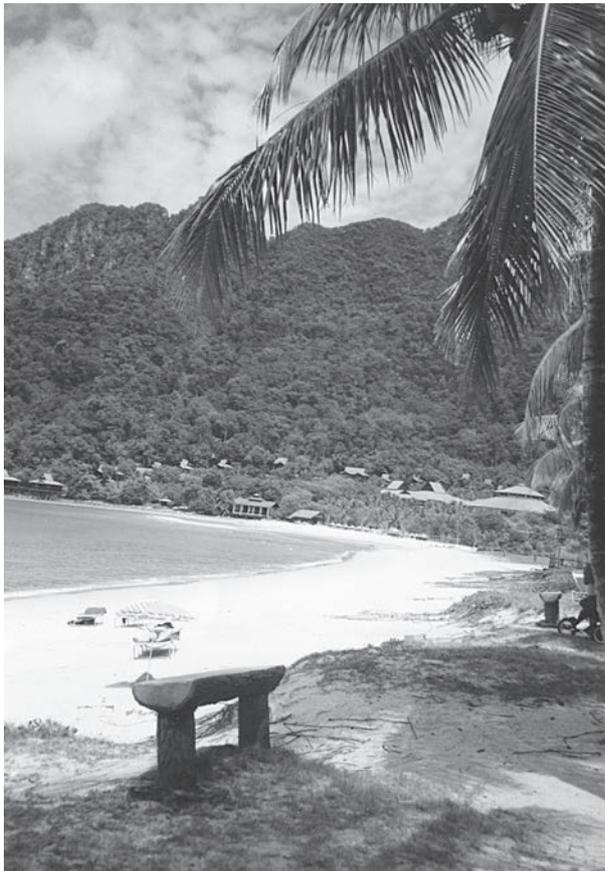
And then we returned to the mid-station and caught the next leg of our cable-car ride to the high peak. Langkawi spread at our feet, cupped between the surfing sea and the mountains, a couple had a foot massage, and a guide told an American

group tales of the history and legends of the island. The most powerful of these stories is the one about Mahsuri. Jealous rivals accused her of adultery and had her condemned to

death. But before she died she put a curse on the island and said that it would not prosper for seven generations. In actual fact, it was only after the seventh generation had passed that prosperity returned to Langkawi. Naturally, Mahsuri is held in great reverence and the **Makam Mahsuri** has arisen around her tomb. We walked through a wooden house reconstructed on the lines of her original home and we visited an auditorium for folk music and theatre. Two women fried fresh, traditional, snacks that resembled rose cookies and lacy papads with a pleasantly sweet-salt flavour. And a gallery housed a mini-zoo. Makam Mahsuri was alive with families and honeymooners when we relaxed in its grounds.



**A wealth of electronics in the Samudra duty free shopping mall**



Independent cottages 'in a forest by the sea'

We drove on, stopped, and then strolled through the friendly zoo of the **Bird Paradise**. Here bright macaws squawked at us, white peacocks strutted, and in the walk-through aviary, flamingos, pelicans, storks, jacanas and a host of curious feathered creatures lived their lives within touching distance. Water flowed, fish shimmered in the pools, a breeze stirred the leaves of trees and bushes and a perky little tit even settled on our hands, peered at us, and then flew back to its nest. It required only a little imagination to

believe that we were in a forgotten Garden of Eden.

On a clear morning, we opted for **The Three Island Cruise**. Langkawi is washed by the crystal-clear waters of the Straits of Malacca with its 99 islands. Many of them are pillar-like rocks, eroded by the sea into curious shapes and covered in vegetation. Some, like the one often referred to as the **Eagle Island**, are

low-lying and tangled with mangroves. This was one of the islands we visited in our cruise and were thrilled by the spectacle of scores of sea eagles swooping down and snatching the meat thrown into the water by our boatman. They dived and swerved and soared so close to us that we could hear the wind rasping through their wings; and yet, none of the winged predators even grazed another's feathers. It was an amazing display of high speed avian aerodynamics.

We sped on, leaving a white wake behind us till we reached

the oddly named **Lake of the Pregnant Maiden**. This large lake is in the heart of a mountainous island, heavily forested. We were told three different myths about a beautiful fairy who had a still-born child by her old husband and consigned the dead baby to the waters of this lake. Many women seeking the boon of a child, make a pilgrimage here and drink the waters of this legendary lake. Most others hire paddle boats for a foot-powered cruise. We immersed bare feet in the water and let fearless fish nibble at our toes. A local guide assured us that it's more therapeutic than a pressure-point massage. It certainly tickled as pleasantly as mild electric shocks. "It stimulates the glands" the guide told a vivacious multi-racial couple who didn't seem to need the therapy!

We saw them again in the unwinding island of **Beras Basah**. Its white coral-sand beach, water like molten sapphires and shade-spreading trees, create a lazy, friendly, sensuous atmosphere. The Sino-Italian couple sat next to us munching on spicy rose cookies. "Do you miss anything?" we asked, wondering if homesickness had struck them. They grinned happily: "What's there to miss?" they chorused.

As we said, Langkawi has everything going for it. ☆



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# FERTIGATION STUDIES IN GARLIC

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## Introduction

Fertigation can be defined as modern technique of the fertilizer application of water soluble and chemical fertilizers through pressurized irrigation systems thus forming nutrient containing irrigation water. This is most efficient method of fertilizer application, gaining popularity all over the world. The method allows applying the nutrients exactly and uniformly only to the wetted root volume where the active roots are concentrated. It is a

farmers friendly, nutrient and water saving, most effective and efficient method of applying fertilizers in which the irrigation system is used as the carrier and distributor of the crop nutrients. This technique not only reduces the fertilizer application costs by eliminating operation but also improves nutrient efficiency as the nutrients are applied very close to plants. The synergism and combination of water and nutrient leads to an efficient use of both by the plant. Fertigation can be applied via simple systems such as by pass tanks as well as through sophisticated computer controlled systems.

Effective and successful fertigation requires an understanding of plant growth behaviour including nutrient requirement and rooting patterns, soil chemistry such as solubility and mobility of the





nutrients, fertilizers chemistry, soil type and water quality factors. Though this fertigation approach is quite new to India and is in limited use due to its complicacy and high price it will be very useful for high valued crops.

An approach for efficient utilization of water and fertilizers is necessary to protect the precious natural resources from degradation. Use of conventional irrigation methods not only results in considerable loss of water but also is responsible for development and wide spread of salinity, water logging and leaching of nutrients from the rhizosphere. Therefore, it is an urgent need to develop easy and economic methods of fertigation through irrigation so that its advantage may be utilized at even lower level by reducing cost of cultivation, increasing nutrient and water use of efficiencies and higher net return per unit area per unit time and input for sustaining our crop productivity and environment in future.

#### Advantages of fertigation

- More healthier & Early maturity of crops

- Higher yield coupled with good quality produce
- Most effective and least expensive way of providing nutrients to growing crops.
- Efficient use of fertilizers by crop leads to increase yield thereby increase in profitability
- Uniform distribution of fertilizers
- Minimize the loss of fertilizers due to leaching
- Uniform, accurate and timely application of nutrients to the crop root zone
- High fertilizer efficiency may be achieved
- Saving of energy and labour
- Flexibility in the fertilizer application
- Supply of nutrients can be regulated and monitored carefully
- Convenient use of compound and ready mix nutrients solutions
- Improve availability of nutrients and their uptake by roots.
- Reduce the ground water

pollution and soil compaction.

#### Importance of Garlic

Garlic (*Allium sativum L*) is one of the important spice cum vegetable crop commercially grown in India. It is also important foreign exchange earner for India. It is used in various processed forms like, powder, paste and pickles. It has very good medicinal property also. India, in spite of being a major garlic producing country, has very low productivity of 4.07 t/ha. The reason for low productivity of garlic are unawareness of the farmers about improved varieties, climate, soil, agronomic practices, pest and disease management and improper post harvest management practices. One of the way is to increase the production and productivity of garlic through drip fertigation. Hence an attempt was made to study the effect of drip fertigation on growth, yield and quality of garlic var.G.41 at National Research Centre for Onion and Garlic, Rajgurunagar, Pune, Maharashtra State.



## Experimental Results

The study was conducted in garlic during the year 2003-2006 to find out optimum nutrient requirement of garlic through drip fertigation. The results revealed that water-soluble fertilizers through drip irrigation improved the yield and yield contributing characters of garlic. The percentage of A grade bulbs were more in 100 per cent of recommended dose of fertilizers as water soluble through drip irrigation than conventional fertilizer

application method. The reduction in fertilizer dose significantly reduced the marketable bulb yield of garlic. The higher marketable bulb yield of 8.77t/ha was noticed in 100% NPK as WSF through drip fertigation in garlic. More over, data from the experimental results indicated that an increase in fertilizer dose from 60-100 per cent, the value of additional yield was less than the additional cost of fertilizer incurred. While calculating the benefit - cost ratio, the treatment comprising of NPK 50:50:80 kg

/ha as basal +50 kg N in seven splits through drip irrigation giving higher net income per unit area (1: 2.95). Based on the last three years results, it is concluded that NPK 50:50:80 kg /ha as basal + 50kg N in seven splits through drip irrigation adjusted the best treatment in terms of yield and benefit - cost ratio. As far as water saving is concerned there was 30-40 per cent saving of water in drip fertigation over surface irrigation.



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# HECTIC ACTIVITY AT SPICES BOARD STAND IN GULFOOD DUBAI

Spices Board's participation in this year's Gulfood in Dubai during March 23 to 26 was tinted by intense and hectic interactions with visitors. In fact the very heavy presence of twelve Indian exporters made the participation more meaningful and realistic. Hundreds of trade visitors hailing from Middle East region made their stop over at the Spices Board stand. There were enormous enquiries.

The exporters who were present reported their satisfaction on being part of the Board in this year's Gulfood for they are optimistic on the positive outcome from their many interactions with visitors. Some of the exporters could finalise on the spot export orders. The companies represented in the fair are: Suresh Exports, Nagpur,



Mr. C.R. Purushothama, Assistant Director [third from left] and Mr G. Gopalakrishnan, Assistant Director, Spices Board with a buyer at the Board's stand in Gulfood, Dubai



Interaction in progress at the stand in Gulfood Dubai

Agri Gold Foods & Farm Products Ltd, Hyderabad, Ramdev Food Products Pvt Ltd, Ahmedabad, Gujarat, Dharamvir Exports Pvt Ltd., New Delhi, Green Bowl Foods, Mumbai, Pardes Dehydration Co., Rajkot, RK Industries, Jodhpur, Rosewood Marketing Pvt Ltd., New Delhi, Selmax Exports Pvt Ltd., Mumbai, Vishnukumar Traders Pvt Ltd., Chennai, Nova

Impex, Mumbai and SA Rawther Spices Pvt Ltd., Bangalore.

Shri G. Gopalakrishnan and Shri C.R. Purushothama, Assistant Directors of the Board represented the Board in the fair.

## FOCUS LAC PROGRAMME TO GO UP TO MARCH 2011

The Ministry of Commerce, Govt of India has decided to extend the FOCUS LAC Programme up to March 2011. This programme was launched by the Ministry in 1997 to enhance trade with countries of Latin American and Caribbean region. The basic objective of the programme is to sensitize and encourage export promotion councils, chambers of commerce and industry, EXIM Bank etc to organize trade delegations, buyer seller meets, fairs and exhibitions in the LAC region. Exporters are requested to avail the benefit of the extension of the programme.



# JAPANESE LIKING FOR GARLIC, HERBS AND CARDAMOM



**Dr K J Madhusoodanan (Left) and Dr M P Suresh (Middle), Deputy Directors of Spices Board seen conversing with a leading importer in Board's Stall.**

There seems to be a Japanese liking for garlic and garlic products, herbs and small cardamom, if one goes by the enquires that were recorded at the Spices Board stand in Foodex 2009 in Tokyo held during March 3 to 6, 2009. Of course other spices were also asked for. Spices and spice products of leading Indian exporters were exhibited in the Board's stall at the Makhuhari Messe in Chiba, Tokyo. The tasting sessions for the visitors for Indian Curry organized by the Board as part of generating popularity for Indian food delicacies received good attention. Indian Masala Tea was served in the Stall with the aid of specially designed brewing equipment "Espresso".



**Discussions in progress at the stand**

Foodex being one of the leading international fairs had representation from a wide variety of food segments drawn from over 65 countries. Dr K J Madhusoodanan, Deputy Director (Research) and Dr. M P Suresh, Deputy Director (Marketing) represented the Board at the fair. Indian spice exporters - Mr Dhansukh Sejal of M/s JFK International, Cochin and Mr Abhey Bansal of M/s. Amaron India, New Delhi who were present had the chance to meet and interact with various importers. Mr R Ramanujam, Minister (Economic & Commercial) and Mr Mohan Chutani, First Secretary (Commercial), Embassy of India were some of the dignitaries who visited the stand.

## OOTY



**Shri L R Rajagopu, Asst Director of Horticulture, Ooty, Tamil Nadu addressing the Garlic growers in Quality Improvement Training Programme held at Ooty in Tamil Nadu on 13.3.2009.**



**A View of Garlic growers attending the quality training programme held at Ooty, Tamil Nadu**



## EGYPT- POTENTIAL MARKET FOR SPICES



**Mr Siddaramappa, Deputy Director [left] and Mr Charles J Kithu, Director [Second from left] at the Spices Board stand in Cairo fair.**

Egypt is an emerging market for Indian spices and there is lot of potential for further intervention in this market. The major spices that are in demand are cardamom, black pepper, tamarind, cumin and cinnamon.

Spices Board has participated in the Cairo International fair, held at Cairo, Egypt from 18



**Mr Charles J Kithu, Director [left] seen in discussion with visitors at the stand**

to 27 March 2009. This was attended by people not only from Egypt but also from countries like Saudi Arabia, Jordan, Syria, Iraq and Palestine. M/s Nova Impex from Bombay was represented in the fair in the Board's stall and he could bag orders for over six containers of spices. Enquires from prospective buyers were obtained.

## MUTHUKAPATTY



**A View of the audience at Regional seminar on turmeric held at Muthukapatty in Tamil Nadu on 14.3.2009**



**Shri Asokan, Assistant Director of Horticulture, Namakkal addressing the growers at Regional Seminar on Turmeric held at Muthukapatty, Tamil Nadu on 14.3.2009 in association with Rathnasamy Environment Rural Development Organization, Namakkal, Tamil Nadu.**



## VALPARAI



**Dr Mohankumar Director, TRF, UPASI, Valparai, Tamil Nadu delivering the Inaugural address at the Planters -Scientists Interface held at Valaprai, Tamil Nadu on 6.3.2009**

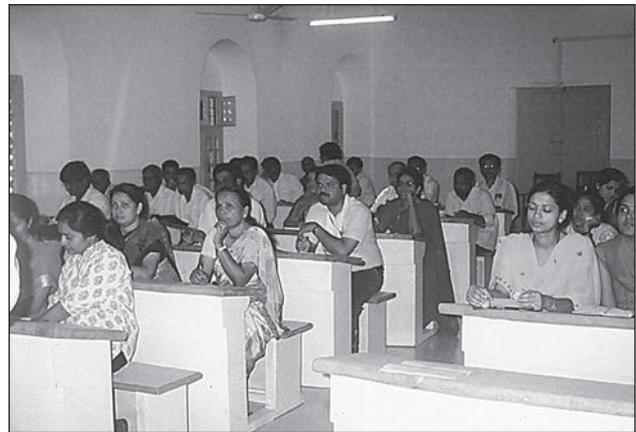


**A View of audience attending the Interface at Valparai, Tamil Nadu**

## DHARWAD



**Dr.B.C.Kamanna , Pathologist, UAS, Dharwad, Karnataka explaining the pest management techniques in chilli crop in the Master Training Programme held on 24th February 2009 in Dharwad. Also seen in the picture are Shri.P.Rameshkumar, Joint Director of Agriculture, Dharwad., Shri. P.K.Suresh, Deputy Director, Spices Board, Dharwad and Dr.S.N.Jadav, Entomologist, UAS, Dharwad.**



**A view of Agriculture Officers attending the training programme.**



## HULKOTI



A view of Agriculture Officers from Gadag district in Karnataka attending the Master Training Programme held in Hulkoti on 25th February 2009.

## MANGAN



A view of State Horticulture / Agriculture /Krishi Vigyan Kendra Officers from North Sikkim attending a Master Training Programme held in Mangan in Sikkim on 24th February 2009.

## PERIYAKULAM



Shri.R.Chandrasekhar, Director (Development) speaking at the Regional seminar on cardamom on 12th March 2009 held in Periyakulam in Tamil Nadu. Also seen in the picture are (from left) Dr.Natarajan, Scientist, ICRI, Spices Board, Myladumparai, Shri.Zia-Ud-Din Ahamed, Member, Spices Board,Cumbum and Shri.K.S.R.J.Rajkumar, Member Spices Board, Cumbum.



A view of cardamom planters attending the seminar.



## KOOTHY



**Dr.K.Dhanapal, Scientist – in charge, ICRI, RRS, Spices Board, Sakleshpur , Karntaka addressing the growers in the training programme on Organic cultivation of spices held at Koothy near Somwarpet in Karnataka.**

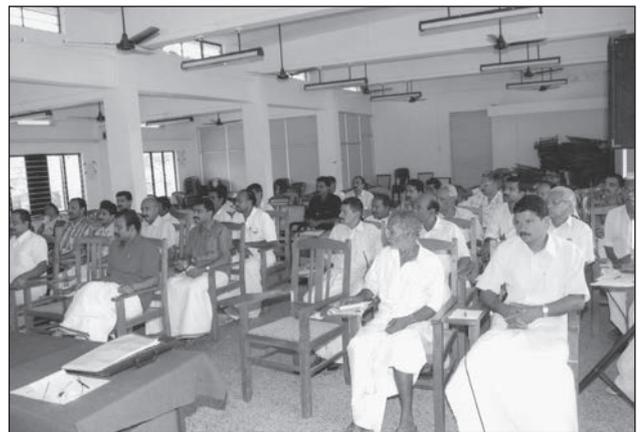


**A view of cardamom planters attending the organic training programme.**

## CHERUTHONI



**Dr.Johny Manihottam, Senior Field Officer, Spices Board, Santhanpara, explaining the techniques of organic farming in a seminar held at Cheruthoni on 19th March 2009.**



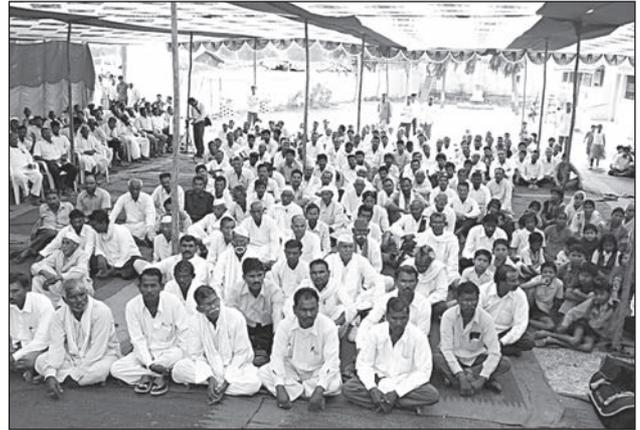
**A view of spice growers attending the organic seminar.**



## BAMANI



Shri. S.S. Sarkunde IAS, District Collector, Bhandara District, Maharashtra requesting the farmers to adopt organic cultivation of chilli and turmeric during a Workshop organised for the development of organic spices in Vidarbha region in Maharashtra.



A view of chilli and turmeric farmers listening the workshop.

# GLOBAL ECONOMIC MELTDOWN: ECGC OPERATIONALIZES STIMULUS PACKAGE FOR EXPORTERS, BANKERS

The Government of India under stimulus package has sanctioned utilization up to Rs.350 crores out of the corpus available under National Export Insurance Account for the benefit of exporters and banks. This will result in additional benefits to the exporters and banks

The percentage of cover is enhanced by five per cent under Export Credit Insurance Policies issued to exporters and by 10 per cent under Export Credit Insurance Covers for banks. The maximum percentage of cover for the exporters is enhanced to 95 percent and

for the banks to 85 per cent.

### FOR EXPORTERS

The additional benefits are made available to the exporters for shipment made between January 2009 and 30.06.2009. The benefits to exporters under Export Credit Insurance Policy (ECIP) covers issued by ECGC and will be made available to all the exporters classified falling under MSME categories. For non MSME category exporters, the benefit will be extended to those exporters dealing in Textile(including handicrafts and handloom), Gems and Jewellery, Leather, Engineering products, Car-

pets, Project goods, Auto components and Chemicals.

### FOR BANKS

For the advances granted to all the exporters classified as MSME sector an additional cover percentage to the extent of 10 per cent will be granted taking the the maximum cover percentage under the ECIBs to 85 per cent. The additional benefits are made available to the banks for advances granted between January 2009 and 30.06.2009.

For any further clarification ECGE offices could be contacted.



## CALENDAR OF OPERATIONS FOR IMPORTANT SPICES - MAY 2009

Timely planning and execution of farm operations based on agroclimatic 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 operation	Details of the operations
<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 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> </ul>



- 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/ha/year).
- 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/ha/year).
- The above two recommendations are made only if no soil test recommendations are available. If available, apply based on soil test results only.
- The said inorganic fertilizers may be applied along with any one of the organic manures like FYM or compost 5 kg or neem cake 1-2 kg per plant in 20 cm wide circular band about 30-40 cm away from the plant base.
- 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.



**II. Pest management**

- For Integrated Pest Management prune dry leaves without removing green leaf sheath.
- Apply quinalphos @ 200 ml per 100 liters of water (spray may coincide shoot borer moth emergence).



**III. Disease management**

**MAIN FIELD**

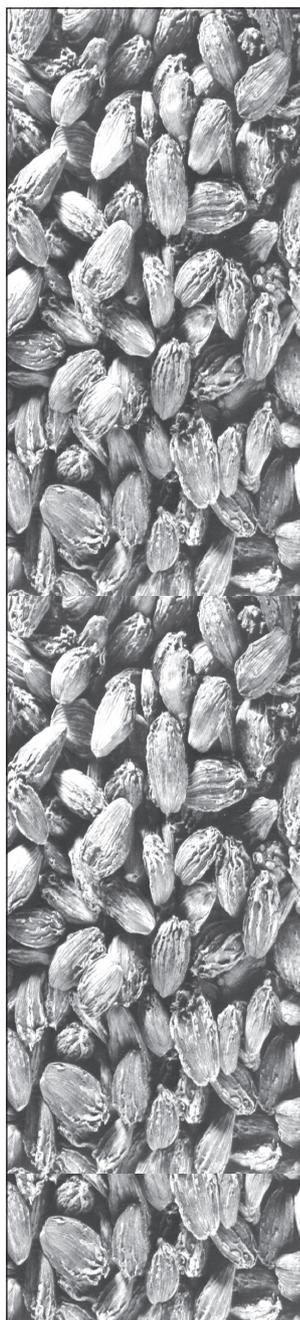
- Provide adequate drainage if water stagnation is noticed.
- Towards Integrated Disease Management against azhukal and rhizome rot in severely affected areas, phytosanitary measures and application of fungicides/bio-control agents may be taken up.
- COC (0.2 per cent), drenching + one per cent Bordeaux 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.
- If bio-control measure is followed, basal application of trichoderma harzianum alone or with pseudomonas fluorescens is recommended.
- Katte infected plants if found must be rouged and destroyed.



**LARGE CARDAMOM  
I Agronomic measures**

**Nursery**

- Disease/pest infected suckers may be removed
- Each and every large cardamom farmer is necessary to raise his own large cardamom nursery for planting in his field at least 500 meter away from large cardamom field.

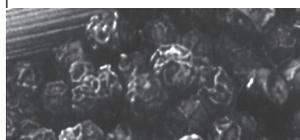


- Regular watering and weeding may be continued in the existing sucker nursery.
- Nursery site meant for sucker multiplication may be cleaned by removing all the weeds; debris and soil may be brought to fine tilth.
- Trenches of 45 cm width and 30 cm depth may be opened at convenient length with an interspace 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.

#### Plantations

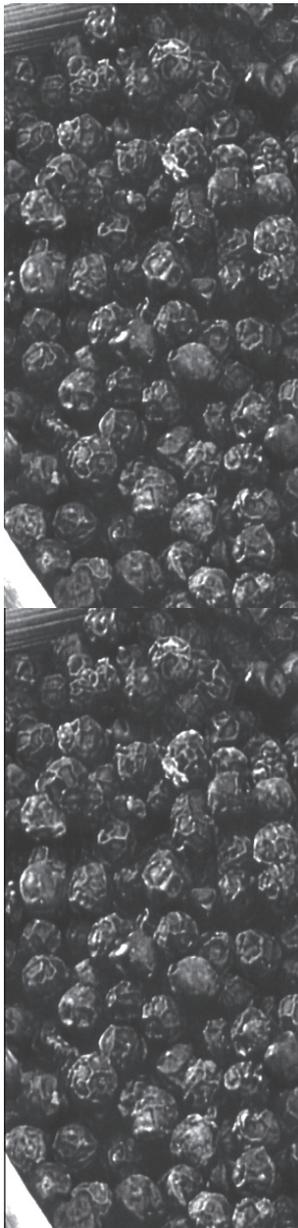
- One round weeding may be attended for easy movement of wild bees for better pollination and fruit setting.
- The large cardamom fields may be visited regularly and chirkey/foorkey etc. diseased plants may be uprooted and destroyed by burning/burial in the soil.
- For replanting/gap filling, the site may be cleared by removing all old & diseased plants and by clearing all weeds and debris.
- 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.
- The planting materials may be selected from high yielding sucker nurseries, free from pest & diseases for replanting/gap filling.
- 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.
- Application of cattle manures/organic manures/fertilizers to cardamom fields will help in getting sustained production, improving productivity and better quality of the crop.
- Application of one per cent Bordeaux Mixture to the cardamom plants will help to control the fungal diseases before the one set of rains.

#### PEPPER I Agronomic measures



#### Nursery

- Watering may be continued in the nursery based on necessity.
- Shade may be reduced in the nursery on receipt of one or two good summer showers.



#### Main field:

- Shade regulation may be done to reduce the shade intensity just at the onset of monsoon showers.
- On receipt of good showers, the shade protection given to young vines may also be removed.
- Planting of standards for new planting may also be done now.
- Apply FYM or compost @ 10 kg/vine.
- In areas where liming is not done last season, lime @ 600 grams per vine may also applied around the plant basin separately.
- For controlling phytophthora foot rot, phytosanitary measures, biological control measures and chemical control measures may be taken up.
- Application of trichoderma harzianum and pseudomonas fluorescens would help in reducing intensity of the disease.
- Addition of organic mulches and oil cakes in the basins improves the texture of the soil and enhances the growth of antagonistic micro organisms.
- 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.
- In case bio-control agents are applied only aerial sprays with chemicals is to be resorted and soil drenching should be avoided.

#### VANILLA



#### Main field:

- Continue irrigation based on necessity, if monsoon rain delays.
- Apply vermicompost @ one kg/vine or FYM or compost @ two kg/vine in the base of the vine and then cover with mulch materials like weed wastes or shade tree loppings and other plant residues.
- If still flowering observed, continue pollination between 6.00 am to 12 noon with skilled labours.



- Prophylactic spray with one per cent Bordeaux mixture may be given or two per cent spray with Pseudomonas sp. (in Talc base) (2 kg/100 liters of water) or one per cent spray with Pseudomonas sp. (in liquid culture) available at ICRI, Myladumpara, may be given.

### GINGER



- Weeding may be done based on necessity.
- After 40 days from the date of basal dressing top dressing with 80 kg of urea has to be done per ha.
- Earth up the beds after top dressing of fertilizer.
- Repeat the mulching of beds with green leaves/weeded materials @ tonnes/ha.

### TURMERIC



- Weeding may be done based on necessity.
- After 40 days from the date of basal dressing, top dressing with 65 kg of urea has to be done per hectare.
- Earth up the beds after top dressing of fertilizer.
- Repeat the mulching of beds with green leaves/weeded materials @ five tonnes/hectare.

### CHILLI

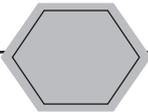


- On completion of harvesting green manuring can be practiced by sowing pulse crops (pillesara, cowpea or sunhemp) in the land proposed for next season cultivation.
- Wherever chilli is intercropped with cotton, dried chilli and cotton plants (after harvest are to be uprooted and cut into small pieces and incorporated into the soil for enhancing the fertility and water holding capacity of the soil).
- If needed soil testing can be taken up during the month.

## TRIPURA



Shri. Dwijendra Mohan Barman, Field Officer, Spices Board, Agartala, Tripura is seen demonstrating the black pepper nursery management techniques to the State Agriculture Officers in a Master Training Programme on organic black pepper production.



## MONTHLY AVERAGE PRICES OF SPICES FOR MARCH 2009

SPICE	CENTRE	GRADE	PRICERS/KG	
Black Pepper	Kochi	Ungarbled	104.24	
		Garbled	109.20	
Cardamom small	Vandanmettu E-Auction	bulk	499.12	
			Bodinayakanur E-Auction	493.21
	Saklasapur Sirsi	419.80		
		Maharashtra	407.77	
Cardamom (L)	Siliguri	Badadana	518.75	
		Chotadana	144.60	
Chillies	Virudhnagar		128.00	
			50.38	
Ginger (Dry)	Kochi	Best	100.00	
		Medium	95.00	
Turmeric	Kochi	Alleppey Finger	48.67	
		Bombay	Rajpuri Finger	74.33
		Bombay	Duggirala	49.17
			Indori	43.50
Coriander		Kanpuri	48.17	
			4%	
Cumin	Bombay		97.92	
Fennel	Bombay	-	84.58	
Fennugreek	Bombay	-	27.58	
Mustard	Chennai	-	31.35	
Garlic	Bombay	-	11.00	
Celery	Bombay	-	11.00	
Clove	Cochin	-	NA	
Nutmeg(with shell)	Cochin	-	126.25	
Nutmeg(without shell)			222.08	
Mace	Cochin	-	425.00	
Cassia	Chennai	-	81.00	
Vanilla*			675.00	

### SPICES SOURCES

Average FOB export price - February 2009

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

### ALL INDIA CARDAMOM AUCTION SALES AND PRICES FOR MARCH 2009 COMPARED WITH MARCH 2008

PERIOD	MARCH 2009		MARCH 2008	
	Quantity sold (Kg)	Average price (Rs./Kg)	Quantity sold (Kg)	Average price (Rs./Kg)
First week	1,76,219	497.24	98,290	573.87
Second week	2,35,141	492.73	89,911	534.53
Third week	2,07,502	474.61	1,08,362	473.68
Fourth week	2,08,067	502.37	44,637	452.16
Fifth week	2,02,679	514.98	66,593	502.42
Total	10,29,608	496.18	4,07,793	513.58

Source: Auction reports received from Licensed Cardamom Auctioneers





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