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भारत
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OFFICIAL NOTICES

Sub: Notice is given under Rule 41(1) of Geographical Indications of Goods (Registration & Protection) Rules, 2002.

1. As per the requirement of Rule 41(1) it is informed that the issue of Journal 63 of the Geographical Indications Journal dated 27th November 2014 / Agrahayana 06th, Saka 1936 has been made available to the public from 27th November 2014.

NEW G.I APPLICATION DETAILS

App.No.	Geographical Indications	Class	Goods
481	Durgi Stone Carving	19	Handicraft
482	Etikkoppaka Toys	20	Handicraft
483	Thanjavur Marakudrai	20	Handicraft
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497	Ratnagiri Alphonso Mango	31	Horticulture
498	Jalgaon Banana	31	Horticulture
499	Marathwada Kesar Mango	31	Horticulture
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501	Jalgaon Bharit Brinjal	31	Horticulture
502	Solapur Pomegranate	31	Horticulture
503	Prosecco	33	Alcoholic Beverages

PUBLIC NOTICE

No.GIR/CG/JNL/2010

Dated 26th February, 2010

WHEREAS Rule 38(2) of Geographical Indications of Goods (Registration and Protection) Rules, 2002 provides as follows:

“The Registrar may after notification in the Journal put the published Geographical Indications Journal on the internet, website or any other electronic media.”

Now therefore, with effect from 1st April, 2010, The Geographical Indications Journal will be Published and hosted in the IPO official website www.ipindia.nic.in free of charge. Accordingly, sale of Hard Copy and CD-ROM of GI Journal will be discontinued with effect from 1st April, 2010.

Registrar of Geographical Indications

G.I. APPLICATION NUMBER – 434

Application Date - 16-08-2013

Application is made by Ratlami Sev Namkeen Mandal, 35, Gopal Nagar, Opp. Teacher's Colony, Sagod Road, Ratlam – 457001, Madhya Pradesh, India for Registration in Part A of the Register of **Ratlami Sev** under Application No - 434 in respect of Food Products falling in Class – 30 is hereby advertised as accepted under Sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- A) **Name of the Applicant** : Ratlami Sev Namkeen Mandal
- B) **Address** : Ratlami Sev Namkeen Mandal,
35, Gopal Nagar, Opp. Teacher's Colony, Sagod
Road, Ratlam – 457001 Madhya Pradesh, India
- C) **Types of Goods** : **Class 30** – Food Products
- D) **Specification:**

Ratlami Sev is a light yellow fried food product manufactured by using traditional formula. Ingredients used for to produce Sev comprises gram flour, clove, black pepper, Asafoetida, brown chilly, Cumin seed, raw salt and ground nut oil. However the main or essential ingredients of Ratlami Sev are gram flour, clove, Black pepper, Asafoetida, Brown Chilly, Raw Salt and Ground Nut oil. Gram flour (1 Kg), 15-20 gms of oil and 20-30 gms of spices (freshly ground cloves, black pepper, cumin seeds, asafetida crystals and dried chillies) are mixed together by rubbing with hands. The mixture is then kneaded into dough by adding roughly 300 ml of water. The dough is mashed on a strainer (sieve) called "Jhara", over fryers which have oil at a temperature of 170-180 degree celsius. The Ratlami Sev are assumed to be ready once the bubbling in the oil reduces, and they acquire a golden yellow colour.

Sl. No.	Particulars	Standards
1.	% Moisture by mass	1.88% Max
2.	% Fat (on dry basis)	47.52% Max
3.	% Salt	2.69% Max
4.	Organoleptic test	Color – Yellow Aroma – Characteristic Physical appearance – Yellow small sticks
5.	Acid value of extracted fat	1.22% Max
6.	% Free Fatty Acid	0.61% Max
7.	Acid Insoluble Ash (on dry basis % by mass)	0.05% Max
8.	Sedimentation value of fat free sample	16.0

E) Name of the Geographical Indication:

RATLAMI SEV



F) Description of the Goods:

Ratlami Sev is the famous savoury snack prepared by using split Bengal gram (chickpea) flour, cloves and peppers, originating from Ratlam, a town in the western state of Madhya Pradesh in India. Ratlami Sev is quite popular right throughout the country because of its unique spicy taste. It is light yellow in colour. This snack is known to have originated in Ratlam and over the years has become a must serve item with the regular food in the states of Madhya Pradesh, Gujarat, Delhi, Maharashtra. Ratlami Sev has essentially been a cottage industry in Ratlam and provides employment to thousands of people of the region. Recently, it has faced competition from several Indian snack companies, which have used the name Sev, accompanied with smart packaging of the product for easy handling and longer shelf life. Ratlami Sev is widely adored for its delicious taste, aroma, nutritional value and fibrous content. Made of gram flour and pepper, the taste has become famous over the years and Ratlami Sev is now exported to foreign countries including Americas and Gulf.

Nutritional Information

Typical Values	Per 100 gm
Energy value	609.16 Kilo Calories
Carbohydrate	31.61g
Protein	13.76g
Total fat	47.52g
Saturated fat	10.58 g
Monounsaturated fat	12.62 g
Polyunsaturated fat	18.04 g
Sodium	590 mg
Dietary fibre	0

G) Geographical Area of Production and Map as shown in page no.: 13

Ratlam is one of the most important districts of Madhya Pradesh, situated in the North West part of the state.

District & State	Latitude	Longitude
Ratlam, Madhya Pradesh	74 31' East to 75 41' East	23 05' North to 23 52' North

Total area of Ratlam district is 4861 km² which is 1.11% of total area of Madhya Pradesh. It is bound by Mandsaur district in North, Jhabua and Dhar on the South, Ujjain on the East, Chittorgarh and Banswara district of Rajasthan on the West and Shajapur district of Madhya Pradesh and Jhalawar district of Rajasthan on the North.

Area	4861 km ²
Altitude	607 m
Rainfall	940 mm annually

H) **Proof of Origin (Historical records):**

The origin of Ratlami Sev dates back to more than 136 years. The Mughal emperors, who happened to cross the Malwa region in the late 19th century, wished to prepare “Sevaiyan”, the wheat vermicelli. However, since they could not procure wheat locally, they made use of the available gram flour and ordered the local tribals (*Bhils*) to prepare vermicelli from it. The name given to the vermicelli thus prepared was “Bhildi Sev”. This Bhildi Sev was the predecessor of the present day crisp delicacy called Ratlami Sev.

The Sakhlecha family of Ratlam was one of the first commercial Sev manufacturers. They had begun to make and sell Ratlami Sev in the early 1900s. Mrs. Lalubai Sakhlecha, aged 100 years is a living testimony of their trade. Her husband Late Mr. Shantilal Sakhlecha along with her father-in-law Late Mr. Kesarmal Sakhlecha established the first shop to sell Ratlami Sev.

I) **Method of Production:**

Ratlami Sev is manufactured by using the following traditional formula:

Ingredients

Gram flour		85.0%
Cloves	}	2.0-3.0%
Black pepper		
Cumin seeds		
Asafoetida		
Dried chillies (bhuri mirch)		4.0-5.0%
Ground nut Oil		20.0-30.0%
Salt		4.0-5.0%

Gram Pulse (Chana Dal) -

Gram pulse (Chana Dal) shall consist of split seed of *Cicer arietinum*. It shall be sound, clean, wholesome and free from unwholesome substances. It shall also conform to the following standards –

1. Moisture not more than 8.0% by weight
2. Foreign matter not more than 0.5% by weight
3. Damaged grain not more than 0.4% by weight
4. Aflatoxin not to be present

Ground Nut Oil –

Ground Nut Oil used for frying Ratlami Sev is expressed from clean and sound groundnuts (*Arachis hypogaea*). It shall be clear, free from rancidity, suspended or other foreign matter, separated water, added coloring or flavoring substances or mineral oil. It shall conform to the following standards –

1. Butyro-refractometer reading at 40° Celsius – 54.8° Celsius
2. % Moisture – 0.11% max
3. % Free fatty acid – 0.46% max
4. Acid value – 0.92
5. Peroxide value – 3.06
6. BTT – 40.5° Celsius

Spices and Condiments – The various spices and condiments used in Ratlami Sev must conform to the following standards.

Cloves

Common name – *Syzygium aromaticum*

% Moisture – 6.50% max

Extraneous matter – 0.28% max

Insect damage matter – 0.30% max

Dried chillies (Bhuri mirch)

Common name – *Capsicum annum*

% Moisture – 9.67% max

Extraneous matter – 0.96% max

Insect damage matter – 2.94% max

Black pepper

Common name – *Piper nigrum*

% Moisture – 9.97% max

Extraneous matter – 0.20% max

Insect damage matter – 0.32% max

Cumin seeds (Jeera)

Common name – *Cuminum cyminum*

% Moisture – 5.17% max

Extraneous matter – 0.20% max

Insect damage matter – 0.12% max

Asafoetida (Hing)

Common name – *Ferula asafoetida*

% Moisture – 6.98% max

Salt (Desi namak)

Moisture – not more than 5.80% by weight of the undried sample

Sodium chloride (NaCl) – not less than 97.5% by weight on dry basis

Detailed procedure for preparation of Ratlami Sev –

- Gram flour (1 kg) is sifted through a sieve to break up its clumps
- To the sifted gram flour are added, 15-20 gms of oil and 20-30 gms of spices (freshly ground cloves, black pepper, cumin seeds, asafetida crystals and dried chillies). These are mixed together by rubbing with hands.
- Dough is then freshly prepared by adding water to the mixture in small quantities. Nearly 300 ml of water is used to knead 1 kg of gram flour mixture. The dough cannot be kept for more than 5 minutes and must be prepared freshly before frying to ensure the unique crispyness of the Ratlami Sev

- This dough is then strained through a metallic sieve called “Jhara”, directly over the frying utensil containing around 3 litres of oil at a temperature of 170-180 degrees celsius. Traditionally oil was heated by burning coal. Coal ambers were arranged in such a manner that ensured continuity of the flame. However, these days Ratlami Sev are fried in oil heated by LPG gas flame.
- The Ratlami Sev are fried for about 2-3 minutes in the hot oil. They are strained out using the “Jhara”, once the bubbling reduces and the Sev begin to float on the surface of the oil.
- The fried Ratlami Sev are then brought down to room temperature by spreading them out on sheets of paper and cooling them using fans. Time taken for cooling differs according to the time of the year or the ambient temperature. The table below exemplifies this point.

Ambient Temperature	Time taken for cooling Ratlami Sev
<30 degrees celsius	15 minutes
30-45 degrees celsius	30 minutes
>40 degree celsius	45 minutes to 1 hour

- Once the Ratlami Sev attain room temperature, they are packaged into polypropylene bags (PP and Flexo) and sealed. It must be noted that these are not vacuum packed and do not contain any preservatives. Once packed, the Ratlami Sev retain their freshness, crispyness and flavor up to 45 days. Once unpacked, they need to be consumed immediately or stored in air-tight containers.

J) Uniqueness:

The characteristic crispyness and distinctive taste of the Ratlami Sev can be attributed to various factors relating to the geographical features of Ratlam district.

Climate of Ratlam:

The city of Ratlam lies 1,575 feet (480 meters) above sea level. Ratlam has humid subtropical climate. Three distinct seasons are observed: summer, monsoon and winter. Summers start in mid-March and can be extremely hot from April through June. Highs can reach 112 °F (44 °C), although the humidity is extremely low. The average rain fall is 37 inches (937 mm). Winters start in mid-November and are dry, cool and sunny. Temperatures average about 39–46 °F (4–8 °C), but can fall close to freezing on some nights. Ratlam gets moderate rainfall of 35 to 38 inches (890 to 970 mm) from July through September, due to the southwest monsoon.

Soil:

The area in and around Ratlam district is covered with fertile black soil which is derived from the Deccan trap and is locally known as the regur or black cotton soil. The texture of this soil varies from loam to clay. The black soil is rich in mineral deposits like lime, augite, calcic plagioclages, olivine and ferro-magnesium. The black soil is used for cultivation of the Chana dal, which is used in the preparation of Gram flour used in Ratlami Sev.

Specifications of Chana Dal:

Chana Dal is obtained when baby chickpeas are split, husked and polished. It is a popular legume in India as it is high in protein and fibre, has great taste and has low glycemic index, making it beneficial for diabetics. It is grown in the black soil of Malwa region of

Madhya Pradesh, which comprises of Dewas, Dhar, Indore, Jhabua, Mandasaur, Neemuch, Rajgarh, Ratlam, Shajapur, Ujjain and parts of Guna and Sehore. Katewala Chana is considered the best and is used for preparing the Gram flour (besan) that is used in Ratlami Sev.

Water:

The water used for preparing the dough to make Ratlami Sev is obtained from the Dholawad Dam of Ratlam, which collects water from the Mahi river (Jhamar tributary). This water is supplied locally by the Municipal Corporation of Ratlam. The hardness of this water was found to be 122.76 mg/ml of calcium carbonate, and 175.61 mg/ml of chloride. Alternatively, the ground water supply (from borewell) was also used. The hardness of borewell water was found to be 372.24 mg/ml of calcium carbonate and 178.67 mg/ml of chloride. These characteristic high hardness and salinity of the water of Ratlam render the Ratlami Sev crisp and tasty. The water is safe for drinking purposes and human health.

K) Inspection Body:

The Ratlami Sev Namkeen Association, Ratlam has representatives from several producing centers across the district. The implementation and assurance of the quality of Ratlami Sev and its genuineness would be monitored by the District level committee formed by the organization.

It is proposed that Inspection Committee shall comprise of –

- 1) Two members of Ratlam Sev Namkeen Association
- 2) One member from an Agriculture University in Ratlam
- 3) One member from Central Food Technological Research Institute (CFTRI), Mysore
- 4) One member from Non-Governmental Organization
- 5) One member from District Industry Centre, Government of Madhya Pradesh, Ratlam

L) Others:

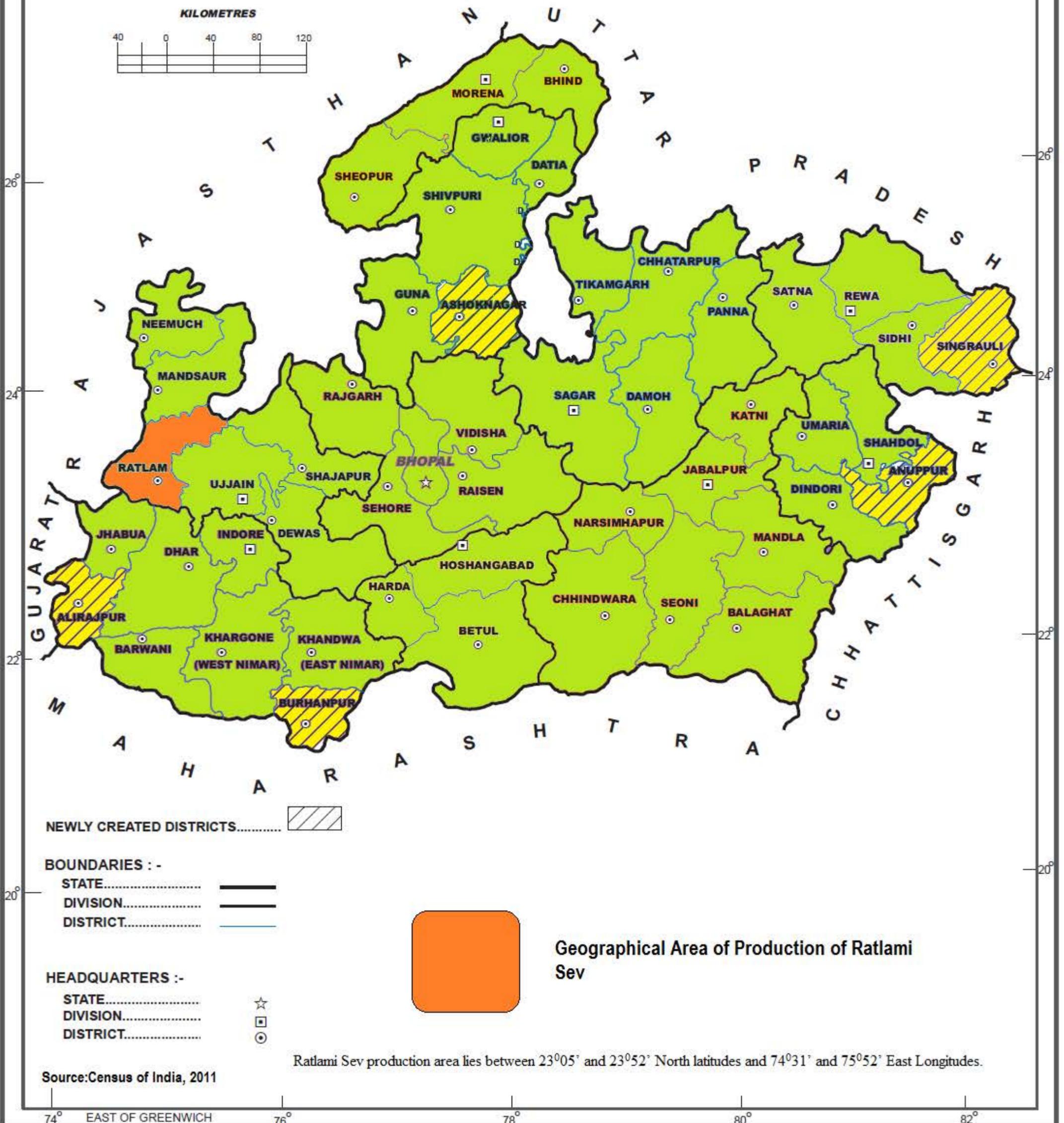
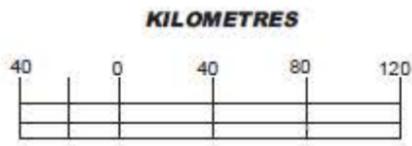
Ratlami Sev has great demand in the domestic and international markets. It is exported to countries like Singapore, USA, China and UK. Ratlami Sev is a well-known name in the world because of its spicy taste and unique flavor.

The history, present popularity and method of production have been clearly elucidated in a book published by Centre for Entrepreneurship Development of Madhya Pradesh (CEDMAP), Bhopal along with Nagar Palik Nigam, Ratlam. The book is published in Hindi and is titled “Ratlami Sev – Nirman, Packaging tatha Marketing”.

Ratlami Sev has been manufactured in Ratlam for over 100 years. The Sakhlecha family, who was one of the first manufacturers of Ratlami Sev in Ratlam, have been felicitated on numerous platforms, and covered by local newspapers.

INDIA
MADHYA PRADESH
(SHOWING DISTRICTS)

Geographical Area of Production of Ratlami Sev



NEWLY CREATED DISTRICTS.....

BOUNDARIES :-
STATE.....
DIVISION.....
DISTRICT.....

HEADQUARTERS :-
STATE.....
DIVISION.....
DISTRICT.....



Geographical Area of Production of Ratlami Sev

Ratlami Sev production area lies between 23°05' and 23°52' North latitudes and 74°31' and 75°52' East Longitudes.

Source: Census of India, 2011

G.I. APPLICATION NUMBER - 438

Application Date: 29-08-2013

Application is made by **North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC)**, 9, Rajpari Path, Ganeshguri, G S Road, Guwahati - 781005, Assam, India for Registration in Part A of the Register of **Tezpur Litchi** under Application No - 438 in respect of Horticulture products (Fruits) – Litchi falling in Class - 31 is hereby advertised as accepted under Sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- A) Name of the Applicant** : North Eastern Regional Agricultural Marketing Corporation Limited, (NERAMAC)
- B) Address** : North Eastern Regional Agricultural Marketing Corporation Limited, (NERAMAC), No.9, Rajpari Path, Ganeshguri, G.S. Road, Guwahati - 781005, Assam, India.
- C) Types of Goods** : **Class 31** - Horticulture products (Fruits) – Litchi
- D) Specification:**

The Tezpur Litchi produced in Assam is the most popular and excellent cultivar of litchi for fresh consumption. The Tezpur Litchi varieties/cultivars have special size, shape, attractive colour, mouthwatering flavour and delicious taste. Tezpur Litchi is characterized by its pleasant flavour, juicy pulp (aril) with attractive colour and small seed with tight pulp.

The shape of the fruits is ovoid /round and the size varies from 3.03 to 3.09 cm .The weight of the individual fruit varies from 16.0 g -30.59 g. Some fruits are still bigger and weigh up to 70-80 g.

The colour of the fruits varies from dull brick red to pinkish brown or attractive red. The pulp is white to greyish white in colour. Peel thickness varies from 0.63 mm to 0.79 mm depending upon the variety.

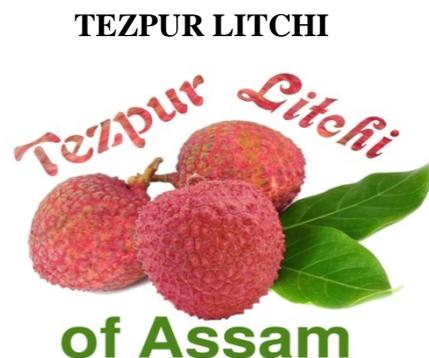
The moisture content in the fruits varies from 77.48 to 82.91 per cent. The composition of the fruit is 56.50 per cent pulp, 16.16 per cent skin, 41.43 per cent juice, 15.06 per cent rag, and 20.71 per cent seed depending upon the variety. The Pulp: Seed ratio is 2.73:1.

The dietary fibre content in the fruits varies from 6.20 - 6.33 per cent. Sugar content varies from 15.59 to 16.28 per cent. Acidity (as citric acid) is about 0.48 percent. TSS content is 15.8-16.4 per cent. Carbohydrates content varies between 18.22 to 18.53 percent. Protein content is about 0.71 -0.73 per cent. It also contains a little fat (0.32 - 0.37%). The fruits contain 54.05 mg of Ascorbic acid per 100 g.

The juice sugar content is highly energy-giving, which varies from 15.59 to 16.28 percent depending on the variety. Tezpur Litchi is a rich source of vitamin C and nutritious containing fair amount of potassium, phosphorus, calcium, magnesium, iron

and small amount of Vitamin B. Its principal chemical constituents are carbohydrates, organic acids, vitamins, pigments and a bit of fat.

E) Name of the Geographical Indication:



F) Description of the Goods:

Family: *Sapindaceae*

Genus: *Litchi*

Botanical Name: *Litchichinensis*

Litchi (*Litchichinensis*) belongs to the Family *Sapindaceae* and Genus *Litchi*. It is one of the finest fruits of the world. It is one of the most delicious, exquisite and nutritious summer season fruit. The litchi tree is beautiful, dense, round-topped and slow growing with evergreen leaves having 6-9 elliptic oblong and lanceolate abruptly pointed leaves. It is a vigorous evergreen perennial tree attaining a height of above 5m with a broad round topped crown and spreading branches. Color of leaves varies from light green to dark green. Greenish white or yellowish flowers are borne in clusters.

The tree is propagated by seed and by air-layering. The trees come into production at three to five years of age. This handsome tree develops a compact crown of foliage, which remains bright green the year round. Thus, it helps to maintain our eco-system in balance to a considerable extent.

Tezpur litchi varieties have some distinctive characters viz., its size and total sugar content of the fruit which make the fruits different from other litchi varieties grown in the country. Ilachi, Bilaiti, Bombaya, Piyaji, Haldia are some locally known cultivars of litchi which grown in this locality.

Physicochemical characteristics of Tezpur Litchi are

Variety	Length (cm)	Shape Index	Fruit Weight (g)	Pulp (%)	TSS 00 Brix	Acidity (Citric Acid-100g)	Total Sugar (g/100g)
Tezpur Litchi	3.06-3.59	Shape Ovoid	27.01-30.59	56.50	13.87	0.729g/100 ml	15.59-16.28

The physical characteristics of the different Tezpur litchi varieties are described in table mentioned below:

Physical Characteristics of Tezpur Litchi

Variety/ Cultivar	Fruit size/ shape	Color	Flesh	Sweetness	Fruiting habit
Ilachi	Round & small. Seed small. Shape is Just like grapes	Shendury	Compact	Sugar sweet & scented	Medium bearing
Bilaiti	Round & very Large. Shape is Just like an apple .Seed is small	Brick red	Compact & scented	Sugar sweet	Profuse bearing
Bombaya	Round & very Large. Small seed. Shape is Just like strawberry	Brick red	Compact& scented	Sweet but slightly sour	Profuse bearing
Piyaji	Elongate & Medium large	Brick red	Loose pulp scented like onion	Sugar sweet	Alternate bearing
Haldia	Elongated Large seed	Yellowish red	Compact	Sweet	Medium bearing
Others	Medium to large	Red	Compact	Sweet	Medium Bearing

The fruit produced in clusters, are ovoid or heart-shaped to round. The color of fruits varies with cultivar, and is red or pinkish or brick red. The edible portion or fruit is the aril, which is immediately beneath the skin. Flavor of the aril varies with cultivar, which is distinctive. Seeds are bold but in some cultivars seeds are partially developed, due to failure of pollination, referred to as 'chicken-tongue' seed. The trees with small seeded fruits are prized because of the greater portion of pulp. It is a cross pollinated plant.

The average yield of litchi is about 7000 – 8000 numbers of fruits from the old trees whereas the new trees are yielding 3000 – 4000 numbers of fruits per year per tree. As reported by the Senior Agricultural Development Officer, Tezpur, the average yield of Tezpur litchi is around 1600 kg per ha. The litchi plants flowers during the month of February starts to bear in March. The fruit mature during May and is harvested sometime around June. The fruits are harvested in bunches from the tree. Maturity of the fruit is determined by the flatness of tubercles and smoothness of epicarp. Shelf life of the fruits is normally 3 days at ambient conditions at 12 -13⁰C and 40-90 per cent Relative Humidity.

The flavor of the fresh pulp is musky, when dried, it is acidic and very sweet. Not only sweet, juicy and tasty, litchi has many nutritive values. The juice sugar content is highly energy-giving, which varies from 15.59 to 16.28 percent depending on the variety. Tezpur Litchi is a rich source of vitamin C and contains fair amount of potassium, phosphorus, calcium, magnesium, iron and small amount of Vitamin B. Its principal chemical constituents are carbohydrates, organic acids, vitamins, pigments and a bit of fat.

The fruit is eaten fresh and canned in syrup. Jelly can also be prepared out of the fruit. A highly-flavored squash prepared from it is quite popular during the summer months. Apart from squash, various kinds of beverages, such as sherbet, nectar, etc. can be prepared from the preserved litchi juice.

In Assam, litchi is grown in all districts, however, the highest area under it is in the district of Sonitpur. Of the different varieties of Tezpur Litchi, the best are Bombai and Elachi, which are exported to foreign countries in a limited scale. The Tezpur litchi is grown completely under organic condition without using any chemicals.

Tezpur Litchi has also earned popularity among the fruit lovers of not only the country but of many countries like USA, Switzerland, etc. Tezpur litchi is an attractive item of the fruit market of Madhya Pradesh, Rajasthan, Uttar Pradesh etc.

G) Geographical area of Production and Map as shown in page no.: 23

Litchi is one of the important fruit crops grown in Assam. Presently, Tezpur litchi is cultivated in Porowa, Darikati, Bhalukpung, Upper Kachari Gaon, Bandarmari, Tamulbari, Khonamukh, Moilagaon villages in Sonitpur district.

The Tezpur Litchi production area lies between $26^{\circ} 30'$ and $27^{\circ} 01'$ North latitudes and $92^{\circ} 16'$ and $93^{\circ} 43'$ East Longitudes.

H) Proof of Origin (Historical records):

Tezpur litchi is a special type of litchi grown in “Lichu Pukhuri” situated in the heart of the Tezpur town and the Village Porowa, just 3 km away from Tezpur town. Presently, it has been planted in other areas also and some nurseries have been established for multiplication. This litchi variety has special size, shape, and attractive colour, mouth-watering flavor and delicious taste.

The “Lichu Pukhuri” formerly known as “Paltan Pukhuri” covers a total area of about 5 bigha including the water area. It has a special micro agro- climatic condition on account of which the litchi bears its special quality. From the history of Paltanpukhuri it is known that during 1922-24 Late Padmanath Gohain Boruah, who was the chairman of Tezpur Municipal Board brought some litchi layers from Kolkata and Mumbai and planted on the bank of that Paltan pukhuri.

In Lichu Pukhuri orchard, Tezpur there are still the old litchi trees. Presently, out of the twenty six litchi trees, eighteen are old trees and rests eight are newly planted. The varieties locally known as *Ilachi*, *Piaji*, *Deshi*, *Bilaiti* and *Bombaya* are in the orchard. The litchi plants of the Lichu pukhuri flowers during the month of February starts to bear in March. The fruit mature during May and is harvested sometime around June. It is marketed not just at Tezpur but exported to other parts of country. The Tezpur litchi is grown completely under organic condition without using any chemicals.

I) Method of Production:

Climate and soil

Soil

The litchi can grow in a variety of soil types particularly in fairly deep, well-drained loam rich in organic matter. A sandy loam or clayey loam with pH ranging between 5.5 and 7 with sufficient soil depth is an ideal soil for litchi cultivation. Water-table should be at least 1.5 to 2 m deep (Bhardwaj *et al.*, 2011).

Climate

In litchi-growing tracts of India, the maximum temperature during flowering varies from 21⁰C in February to about 38⁰C in June. Winter frost and dry heat in summer considerably damage the growth of the plants. It causes fruit cracking and subsequently damages the pulp. Humidity is another important factor for the successful cultivation of litchi. Although it can grow up to an altitude of 800 m above the sea level, the best growth and yield is obtained at lower elevations. Well spread rainfall or adequate supply of irrigation water is essential for litchi cultivation. A constant rainfall at the time of flowering however interferes with pollination. (Bhardwaj *et al.*, 2011)

Propagation

Litchi is generally multiplied by vegetative methods of propagation as plants raised through sexual method (by seed) grow slowly, have a long juvenile period and do not produce fruit true to the type. However, earlier introduction in different parts of the country was perhaps through seeds, which enabled the selection of superior types and perpetuation the cultivar through vegetative means. Although litchi can be propagated asexually by various ways the most common and easiest method adopted all over the world is air-layering. Stooling method of propagation is becoming popular due to higher success rate as compared to air layering. The most commonly practiced method of vegetative propagation is air-layering, though cutting, grafting and budding have been found to be successful (Anon.2000-06).

Air-layering

Air-layering or 'gootee' is widely accepted method of propagation in India. In this method a healthy and vigorous, upright twig of about one year old and 2.5 to 4 cm in diameter is selected. A circular strip of bark about 2 cm wide just below a bud is completely removed from the selected twig. Care should be taken to remove all the cambium tissue surrounding the white central wood while removing the bark. Moist sphagnum moss is packed around this portion and tied with polyethylene sheet, which prevents the loss of moisture. In about 6 weeks, when the roots are visible through the polythene wrap, the rooted branch is detached from the parent plant and potted in the nursery. Top of the branch is cut back to maintain a proper ratio of leaves and roots.

Since, air-layering is a commercial practice, a large number of private nurseries have come forward for large scale multiplication of plants especially in litchi growing regions. It is estimated that about 300,000 litchi plants of different cultivars are produced annually. The regulatory framework to ensure the quality of plants is not in place, thus the creditability of public institutes or private nurseries determine the preference of growers. The cost of plants also becomes a factor in determining the preference of farmers.

Land Preparation

Before layout the land is cleared of bushes and other weedy vegetation and is leveled with a mild slope in the opposite direction of the water source. To improve the fertility of the soil organic matter is added. A green manure crop is grown and incorporated into the soil, which improves its fertility, moisture holding capacity and physical condition.

Young litchi plants are susceptible to hot winds and cold waves. Therefore suitable wind break trees like silver oak, sesbania, drumstick, etc. should be planted along the boundary of litchi plantation. Young plants can also be covered with thatch by the end of November to protect them from frost injury.

Planting

Planting is normally done during August-September after the monsoon has set in. Water is applied immediately after planting. Planting is not advisable when the weather is too dry or too wet.

Only 6 to 9 months old healthy plants with fine roots should be selected for planting. The plants are planted by making a small hole in the center of the pit sufficient to accommodate the soil ball. It is advisable that the new plants should be inoculated with mycorrhiza and after planting the land should not be allowed to dry completely. The soil around the plant is pressed gently. Planting should be immediately followed by irrigation. In case of high wind velocity the plants are tied to the stake.

Fertilizer and Nutrient Management

The nutrient requirements of litchi are very high. Apart from the requirement of N, P and K, which contributes, to profuse vegetative growth and flower initiation, micronutrients such as Calcium, Magnesium, Zinc, Boron and Copper play an important role in flowering and fruiting. In India litchi is grown mostly in the fertile belt and hence very little or no fertilizer is given. However, soil analysis should be done to determine the exact doses of fertilizer.

Irrigation

Litchi can grow without irrigation in areas with rainfall (>125 cm) well distributed throughout the year. Frequent irrigation is necessary during early plant growth. Irrigation is withheld four months prior to flowering.

Irrigation of the young trees should be done by the basin system. As the tree grows, the basin should be gradually enlarge.

Intercropping

Litchi is a slow growing plant and takes about 15-16 years to develop canopy and cover the area. During the initial period of establishment, the space between the plants can be utilized for planting of filler plants/intercrops. The planting of guava, custard apple, lime/lemon in the centre, between and within the rows of litchi have been found to give additional income in the initial stage of planting without competing with the main crop. Papaya is also planted as filler plant at the spacing of 2.5m x 2.5 m. In between the plants in the initial stage, cowpea, french bean, okra, brinjal or other suitable crops of the regions are grown as intercrops. In the mature litchi orchards, cultivation of partial shade loving plants (ginger, turmeric, elephant foot yam) is practiced successfully, which provides additional income.

The litchi is a slow-growing tree and takes at least six years to come to flowering and fruiting. Intercrop like legumes in pre-bearing stage of trees not only provide more income but also improve health of the trees. The choice of intercrop depends upon the climate and soil and marketing facilities. Vegetables or leguminous crops like pulses, berseem, etc. can be successfully grown during the initial stages. Some quick-growing fruit plants such as drumstick, papaya, and banana can also be grown in the early years of a litchi plantation. Papaya and banana are more suitable due to their upright growth and due to short productive life of 2-3 years. While growing intercrop, care should be taken to ensure that the intercrop is not grown at the cost of the litchi plants. The rows of intercrop should be kept away from the litchi tree.

Training and Pruning

Training of young litchi plants is done to establish a good framework. Pruning is usually done to remove the dead or diseased branches and damaged shoots. Since litchi flowers are borne mostly on current year's growth, the removal of the ends of the fruiting branches promotes new shoots and flowering next year. Therefore while harvesting; a portion of the twig is cut off along with the fruits. When the trees become too old and produce fruits of small size, heavy pruning improves the yield and quality of fruits by promoting new shoot growth.

Harvesting and Handling

Harvesting

The fruits are harvested in bunches along with a portion of the branch and a few leaves. At the time of harvesting care is taken to harvest the selected bunch, which has attained the desirable maturity as determined by colour development and taste of the pulp. The fruits are harvested early in the morning when temperature and humidity are congenial, to have longer shelf-life of the fruit. At the time of harvest fruits are collected in a manner so that they do not fall on the ground. The harvesting period is generally May-June, depending upon cultivar and location.

Yield

The yield of litchi varies according to the age of the tree, agro-climatic condition and maintenance of the orchard. Usually about 80-150 kg fruit/tree is obtained from 14-16 year old trees. However, from a fully grown tree a yield of 160-200 kg/tree has also been recorded. Apart from a management practice, bee keeping in litchi orchards has been found to increase the yield of quality fruits by 15-20 percent, since litchi needs cross-pollination. *Apis mellifera* is the commonly used bee in litchi orchards, which also provide additional income from honey.

Litchi tree comes to bearing at the age of 3 to 4 years with proper care and management. The flowering starts from latter part of January or early February and fruits ripen in April and May when the atmospheric temperature is high.

Maturity of the fruits is indicated by the red colour with a fruit size of minimum 25mm diameter. Besides colour the maturity of the fruit is indicated when tubercles become somewhat flattened and the shells become smooth. Litchi fruits should be harvested fully-ripe because they do not continue to ripen after harvest. The fruits for local market should be harvested at the full ripe stage as indicated by the attractive skin colour while for distant market the fruit is harvested slightly early, when they have just started turning reddish or pinkish. Litchi fruits, like other fruits, are not harvested individually, but they are harvested in bunches along with a portion of the branch and a few leaves as it prolongs the storage life of fruits. If the individual fruit is harvested, the skin at the stem end is ruptured and the fruit rots quickly.

Post-Harvest Management

Litchi deteriorates very fast after harvest. Pericarp browning is a major post-harvest problem, which renders the fruit unmarketable. Browning is associated with desiccation. Peroxidase activity coupled with ascorbic acid oxidation enhances anthocyanin degradation. Techniques to reduce browning and maintain the red color and prolonged storage life include sulphur treatment and packaging in perforated plastic bags and storage under cold conditions. Sulphur dioxide (SO₂) fumigation is used as a post-harvest treatment to reduce browning. SO₂ treated fruits have a bleached pericarp which turns

uniformly pink in colour after 2-3 days. Fumigated fruits absorb 30-65 percent of applied SO₂. There is increasing concern about the residue of sulphur and the residual limit is only 10 ppm. For sea transportation 600-650g sulphur is recommended for the duration of 50-60 minutes, while for air transport 300-400 g sulphur for 30 minutes are advocated.

Storage temperature of 2-5°C is considered to extend the shelf-life. Use of perforated polythene bags and storage at 3°C has also been reported to increase shelf-life. Controlled atmosphere storage is considered better for maintenance of the freshness of the fruits. Thus, to have better post-harvest life of fruits, careful harvesting, pre-cooling, transportation in cool van, sulfuring and storing at 2-3°C would be essential.

Storage:

Litchi fruit cannot be kept for more than a few days after harvest, at room temperature. If marketing is delayed fruits should be kept in cold storage where they can be stored in good condition for 3-4 weeks. ¹⁶Fruits could be stored at 2°C in perforated polythene bags for 5 weeks without much spoilage. For short-term storage less than two weeks, a temperature of 7°C is satisfactory. A relative humidity should be kept at 90-95% throughout storage and transport.

Controlled atmosphere storage (3-5% O₂ and 3-5% CO₂) reduces skin browning and slows down the losses of ascorbic acid, acidity, and soluble solids. Exposure to oxygen levels below 1% and/or carbon dioxide levels above 15% may induce off-flavors and dull grey appearance of the pulp.

Cool Chain:

Cool chain is essential during the transport of export quality commodity all the way from the farm to the customer. This helps in maintaining the temperature inside the box at the same low level as in the cold storage.

Packing:

After harvesting, fruit should be packed as quickly as possible, as their quality deteriorates markedly, if they are exposed to sun even for a few hours. For domestic markets litchi is usually packed in small bamboo baskets or wooden crates. These are lined with litchi leaves or other soft packing material as paper shavings, wood-wool, etc.

Proper packing of fruits is important in maintaining freshness and quality and preventing fruit decay during transit for marketing to distant places. A good box for packing fruits should be light in weight, shallow and rigid enough to protect the fruits. It should have few holes for ventilation and rope handles on either side for lifting the box. Fruits are packed in clusters along with few leaves.

Transportation:

The fruit along with twigs is packed and transported by truck to the wholesalers and retailers of the nearest towns. During transit care should be taken to avoid crushing of fruits and damage of the skin. Litchi being a highly perishable fruit, its marketing should be done as early as possible.

J) Uniqueness:

The Tezpur Litchi varieties have special size, shape, attractive colour, mouth-watering flavour and delicious taste. Tezpur Litchi is characterized by its pleasant flavour, juicy pulp (aril) with attractive red colour and small seed with tight pulp. A single piece fruit of

Tezpur Litchi weighs around 70 – 80 g which is the largest in size among all the varieties of litchi grown in Assam. It fetches a high price in the market and normally sold in the local market at Rs.19 -20 per fruit in its peak season.

Flowering of the trees starts from February, and is harvested in the month of June –July. Bearing habit of the trees varies according to the varieties.

- (i) The Tezpur Litchi varieties have special size, shape, attractive colour, mouth-watering flavour and delicious taste.
- (ii) Due to the unique and complex combination of soil- climatic conditions prevailing in the region of Tezpur litchi growing tract, litchi produced in this region are having distinctive and naturally occurring characteristics, which have won the patronage and recognition of both local consumers and outside consumers. The varieties grown in other areas, the characteristic qualities get diluted.
- (iii) Tezpur Litchi weighs around 25 – 30 g which is the largest in size among all the varieties of litchi grown in the country.
- (iv) The total sugar content of Tezpur litchi is the highest compared to all major litchi varieties.
- (v) As there is no pest and disease incidence in Tezpur litchi growing tract, no chemical plant protection is followed. Farmers are following the natural way of cultivation practices and apply no inorganic fertilizers.

K) Inspection Body:

Internal Watchdog Mechanism

The quality of Tezpur Litchi will be monitored by internal watchdog mechanism in order to maintained the original physical and chemical characteristics as per GI registration by the following committee members

- I. Producer groups of Assam
- II. Horticulture department officers
- III. Representative of NERAMAC in Assam

This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. The committee will frame the terms and conditions to use brand name of GI registered Tezpur Litchi by any of the marketing agency. The logo of Tezpur Litchi will be used to create brand image of GI registered produce.

Regulation of GI in the territory

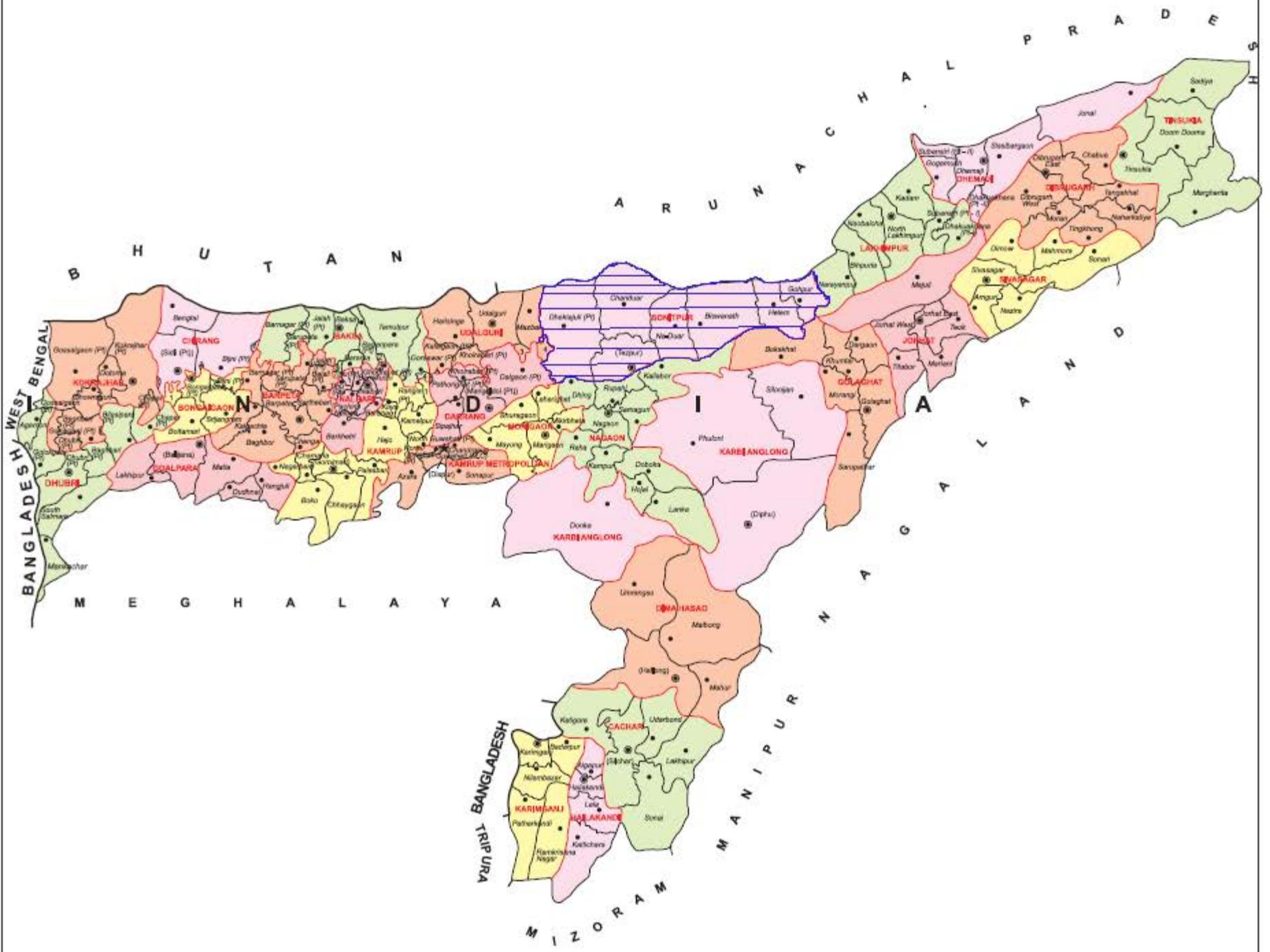
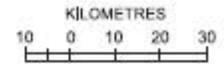
To regulate the use of GI in the territory, the Inspection Structure is proposed to consist the following members:

- Senior Scientist from ICAR Institute
- Director of Horticulture, Government of Assam
- Farmer Member
- Managing Director or his representative, NERAMAC

Tezpur Litchi in the geographical production area will be identified and will be allotted an identification number to ensure traceability and quality.

Geographical Area of Production of Tezpur Litchi

ASSAM

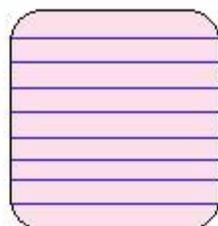


BOUNDARIES:

- INTERNATIONAL.....
- STATE.....
- DISTRICT.....
- REVENUE CIRCLE.....

HEADQUARTERS:

- STATE.....★
- DISTRICT.....⊙
- REVENUE CORCLE.....●



Geographical Area of Production of Tezpur Litchi

The Tezpur Litchi production area lies between 26° 30' and 27° 01' North latitudes and 92° 16' and 93° 43' East Longitudes.

G.I. APPLICATION NUMBER - 465

Application Date: 10 -12 - 2013

Application is made by **North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC)**, 9, Rajpari Path, Ganeshguri, G S Road, Guwahati - 781005, Assam, India for Registration in Part A of the Register of **Khasi Mandarin** under Application No - 465 in respect of Horticulture products (Fruits) - Orange, falling in Class - 31 is hereby advertised as accepted under Sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- A) Name of the Applicant** : North Eastern Regional Agricultural Marketing Corporation Limited, (NERAMAC)
- B) Address** : North Eastern Regional Agricultural Marketing Corporation Limited, (NERAMAC), No.9, Rajpari Path, Ganeshguri, G.S. Road, Guwahati - 781005, India
- C) Types of Goods** : **Class 31 - Horticulture products (Fruits) - Orange**
- D) Specification:**

The Khasi mandarin (*Citrus reticulata*, or Sohsohnamtra in Khasi) is a little bigger than a tennis ball in size. The fruits are globose to oblate with smooth surface. The colour varies from orange-yellow to bright orange and bright orange. It is distinguished from other mandarins by its tight and smooth skin. Unlike other mandarins, it is not easy to peel, but has more flesh and juice. Once peeled and cut, it releases its sweet, aromatic juice, which makes the khasi mandarin a favourite amongst all the oranges.

The Physico-chemical characteristics of Khasi Mandarin collected from Meghalaya are given below:

S. No	Characters	Specifications
1	Fruit weight (g)	134.50
2	Peel thickness(mm)	3.21
3	Number of Segment	10.00
4	Seeds per fruit	18.50
5	TSS	11.56
6	Acidity (%)	0.64

- E) Name of the Geographical Indication :**

KHASI MANDARIN



F) Description of the Goods :

Class: *Magnoliopsida*

Order: *Sapindales*

Family: *Rutaceae*

Genus: *Citrus*

Species: *reticulata*

Scientific name: *Citrusreticulata* Blanco

Khasi mandarin orange belongs to the Family *Rutaceae*, Genus *Citrus* and the Species *isreticulata*. The Scientific name of the Khasi Mandarin is *Citrusreticulata* Blanco. Mandarin is very important fruit crop, second only to banana. It is usually consumed in raw form or in fruit salads as well as juice.

The fruit consists of three layers:

- (i) The outer yellow/orange peel is with oil glands which exude the essential oils, producing the typical orange odour.
- (ii) The whitish thread like mesocarp.
- (iii) The endocarp consisting of 8 - 10 segments filled with juice sacs (vesicles).

It is distinguished from other citrus species by the relatively loose skin of the fruits, the relative ease with which the segments can be separated, and (in most cultivars) the green cotyledons.

Mostly, the Mandarin tree is more erect than other kinds of citrus trees and many exhibits a drooping habit because of rather long, willowy branches. The wood is somewhat more brittle than other citrus and branch breakage is common under heavy fruit bearing unless some support is provided. Most varieties of Mandarin are self-pollinated, but some of the hybrids are self-incompatible and will produce few fruit in the absence of suitable varieties for cross pollination. Mandarin tends to alternate bearing, with a heavy crop in one year followed by a lighter crop in the next season.

Citrus fruits trees are small size and evergreen trees that are grown in tropical and subtropical climates. Generally, citrus trees start bearing fruits 3 - 5 years from planting (although economic yields start from the fifth year and the trees may take 8 to 10 years to achieve full productivity) and can be harvested 5 - 6 months from flowering depending on the variety and the environment. Only a small percentage of flowers produce fruits. Citrus trees require a rich, well-drained soil. Citrus growing needs periodical fertilization and irrigation of the soil, as well as pruning of the tree.

Unlike some other fruits, citrus fruits do not ripen further once they have been removed from the tree, so it is important that they are picked at the right stage of maturity. Maturity is measured depending on different characteristics such as colour, juice content, level of soluble solid (sugar) and solids to acid ratio. Normally, citrus fruits are harvested by hand. Fruit is best harvested after 8:00 in the morning, when dew has dried up, since otherwise, if the fruit was still wet, it would become dark and get spoiled. In addition, as citrus fruits are cold-sensitive (the plant dies at 3-5⁰ C below 0⁰C); growers must have special care to protect the trees against cold. Strategies to protect from cold may include the selection of the proper citrus tree variety and rootstock for the location, selection of the proper planting site and allowing the tree to acclimate to the cold. Protection from frost methods includes also the use of wind machines and the application of water. The

general way to pick the fruit is by pulling it from the stem, using gloves in order to avoid damaging the fruit. Once harvested, the fruit has to be graded, sorted, washed and waxed, before being packed for delivery to the fresh market.

The season harvesting Khasi mandarin in Meghalaya starts from November to February and method of harvesting is hand picking.

G) Geographical area of Production and Map as shown in page no.: 34

Meghalaya Khasi Mandarin production area lies between 25⁰1' and 26⁰5' North latitudes and 85⁰49' and 92⁰52' East Longitudes.

H) Proof of Origin (Historical records) :

Tanaka reported that the species, *Citrus reticulata* Blanco was found in Assam (undivided Assam) while he surveyed the area during 1939. He mentioned that the species was known as Sohniamtra or Santra of West India. Now Mandarin (*Citrus reticulata* Blanco) is one of the important horticultural crops, grown mainly in Assam, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Rajasthan, Tamil Nadu and West Bengal. Citrus fruits are believed to be originated in the tropical and sub-tropical regions of South East Asia, particularly India.

A vast citrus diversity exists in the North eastern region in wild, semi wild form and is found either in homestead or in forest. The North Eastern Himalayan Region is the natural home of many citrus species like *Citrus indica*, *C.assamensis*, *C.latipes*, *C.macroptera*, *C.reticulata*

Khasi Mandarin Orange is the most important commercial fruit crop of Meghalaya and it is well known for its high quality with commercial value.

I) Method of Production :

The packages of practices of cultivation of Khasi Mandarin are describe hereunder:

Climate

Citrus fruits thrive in the tropical, grow well in sub-tropical and can endure a temperate climate. Citrus fruits can be grown commercially from the sea level to an altitude of 1000m in the hills of north eastern region.

However, on higher elevations, mandarin orange has been found to loose its sweetness. Mandarin orange and other citrus fruits can be grown well within a range of 2000 mm to 3000 mm of annual rainfall, evenly distributed throughout the year. Heavy rain at the time of flowering, after a long dry spell, can cause excessive vegetative growth and poor flowering. In heavy rainfall areas, especially during the rains, the problem of excess water can be avoided by planting the fruit trees on the slopes rather than at the foot of the hills.

An optimum temperature of 13 to 25°C is required for successful production of most of the citrus fruits. Extreme heat and extreme cold are not desirable. In higher temperatures orange gets sun burnt. Mandarin does well in hills of the north eastern region with cool summer. Mandarins ripen well with better colour during comparatively cool summers. When the fruit ripens in hot weather, it soon passes from maturity to granulation.

Thus, in the lower foot hills where plants receive scorching heat, the fruits on the outer side of the trees develop poor colour. Low humidity usually favours better colour development of fruits, while in more humid conditions the fruits are juicier with thin rind. In the north eastern hill region, where temperature drops significantly in winter, citrus trees not only get a proper rest period for flowering in spring, but their fruits also develop good colour. In higher altitudes, citrus fruits are subjected to occasional frost injuries.

Soil

Citrus fruits grow in almost any soil. However, the soil best suited for citrus is a well drained loam or clay loam with a depth of 2.5 to 3.5m and rich in organic matter. In the north eastern region, mandarin orange has been growing remarkably well in the calcareous rock and acidic soils, producing oranges of excellent quality particularly in Meghalaya. In this region citrus fruit do best on soils with pH range of 5.5 to 7.5. They can be grown in highly acidic soils, provided liming is done. Khasi mandarin orange can tolerate more acidity than other citrus fruits. In the hills, the lower slopes are preferred for plantation to avoid scorching and effects of wind. In the foot hills, north facing sites are selected, while in higher altitudes, south and east facing hill slopes are preferred for plantation of mandarin orange and sweet orange.

Propagation

Mandarin orange (Khasi variety) is invariably propagated by seed. The seedlings, due to polyembryony, come remarkable true to type. Weak seedlings are generally gametic, while those which are uniform in growth and size are believed to arise from vegetative tissues and should be selected for future plantation.

To get high yielding, standardized planting material with desired size and characters, it is necessary to raise a nursery of budded, grafted or layered plants, depending upon their suitability to the specific conditions. Mandarin orange are invariably propagated by shield budding in spring.

For raising root stocks for budding, the seeds should be sown fresh after extraction within 15 days otherwise the seeds may lose their variability. For deferred sowing, the seeds should be dried under shade. They should then be treated with agrosan GN or captan and kept in an air tight container or in alkathene bags in a cool dry place.

The best root stock for different citrus fruits has to be chosen based on the soil and climatic conditions before planting the trees. The rootstock should be very hardy and capable of promoting vigorous growth without affecting the quality and yield of fruits, and should be fairly resistant to diseases. Since the trees have to live long, they should be free from fungal and virus diseases, which are causes of concern to citrus growers. A suitable root stock is therefore, a boon to the citrus industry.

Some important root-stocks of citrus are described below:

- **Rough lemon (*Citrus jambhiri*):** It is one of the best root stocks for mandarin orange in this region and also in other parts of the country. This rootstock is most suitable for planting in loose soil. At nursery stage, growth of budded top is slow but after planting in an orchard they grow faster. Citrus fruits budded on rough lemon produce fruits of an average quality and with comparatively thicker rinds. Mandarin orange, sweet orange and grapefruit can be successfully propagated on rough lemon root stocks. This root stock has the ability to withstand Tristeza virus.
- **Rangpur lime (*C. limonia*):** This root stock has proved very successful for raising some sweet orange and mandarin orange varieties in Maharashtra and Karnataka.

This root stock is resistant to Tristeza virus but highly susceptible to exocortis. It is also recommended for this region till any other rootstock is found to be promising.

- **Cleopatra mandarin** (*C. reshni*): This root stock is popular in few citrus producing countries, and has been introduced in our country. This root stock is resistant to fungal diseases and is tolerant to Tristeza virus. It is compatible with most of the commercial citrus varieties and makes a smooth bud-union. This root stock may be used in this region after trial.
- **Trifoliate orange** (*Poncirus trifoliata*): This root-stock can be successfully used for planting citrus fruits in high altitudes. It is capable of imparting hardiness to trees in cold areas and resistant to soil borne diseases.

Planting

In this region a virgin forest soil is generally selected for plantation, hence land preparation starts one year ahead of planting. Land preparation includes cutting of forest trees and vegetation, followed by burning and removal of stumps. Complete destruction of stumps is essential to avoid termite growth in plantations, especially in hill areas. Other land preparation practices like ploughing, hoeing, pit preparation etc. depend considerably upon topography or land. On a flat land, preparation starts early, but on steep slopes, land preparation starts one month ahead and is only confined to the preparation of pits.

In plain valleys or flat lands and in lands with mild undulations, square or rectangular system of planting should be adopted. On hill-slopes the contour system is the best, either with terrace or with flat circular or half-moon beds on steep slopes. Pits 1 m in size and at a distance of 6-7 m are prepared for mandarin orange. Pits once dug are allowed to remain exposed for a period of 15-20 days for deeper penetration of sunlight to the bottom of the pits. They can also be sterilized by burning firewood inside them. This practice also adds potassium to the soil in the pits. These pits are then filled with 40-50 kg of farm yard manure or compost mixed with 2-2.5 kg of bone meal and 4-6 kg of wood ash in mound 8-10 cm above ground level. This allows the soil in the pit to settle down properly and also prevents collection of water at the base of the plant in the later stages. In the north eastern region, planting should be done from April to June with the first one or two showers of rain as well as in later part of monsoon. However, early monsoon planting is preferable. Budded plants mandarin orange are transplanted in the field after about one year, when they attain a height of about 60 cm along with a ball of soil with each plant for avoiding injury to roots. While placing the plants in the pits care should be taken that bud union remains 12-15 cm above the ground level.

Cultural Practices

In the north eastern hill region, citrus plantations are seldom put under planned cultivation, and plantations are always kept under sod or raised as mixed crops. In the southern slopes of Khasi hills of Meghalaya, the orchards are mostly of mixed types, having other perennial species such as arecanut, jackfruit, banana etc. resulting in a lanky growth of orange trees with a very poor canopy development. Undesirable intercrops such as turmeric grown in Jaintia hills in mandarin plantations causes very serious root injury. Mixed plantations and undesirable intercropping are the main reasons for poor yield of existing orchards.

Unless the land is terraced properly, cultivation causes erosion of the soil in hill slopes. Under these circumstances, cultivation and manuring should be confined to circular beds of individual trees. The main object of cultivation in this condition is to keep the plants free from weeds. The feeding roots of the citrus plants are within 25-30 cm of the soil

surface. So cultivation should be superficial. Growing of leguminous fodder, namely cow pea as a cover crop during the rainy season is recommended to control weeds and to check loss of soil from erosive actions of rain water. Other leguminous vegetables can also be grown successfully as intercrop during monsoon. Among the fruit crops, pineapple, papaya and banana can be raised in the early stages of plantation without affecting normal growth of the main plantation. Planting of pineapple suckers in double row beds on contours in half moon terraces are also helpful in minimizing soil loss by surface run off during monsoon. Artificial mulches have been found useful. Dry leaf mulch or black polythene mulch conserves moisture, regulates soil temperature and checks weed growth.

In the north eastern hill region, natural vegetation, mostly weeds is a problem, hence use of herbicides as an alternative to manual weeding to control the weeds in citrus orchards may prove more effective. Herbicides like monuron, diuron, bromacil, terbacil and simazine can be successfully used at the rate of 3 to 5 kg per hectare. They generally give effective control for a period of 4-6 months. They must be incorporated into the upper layers of the soil to reach the roots of the germinating weeds. Doses of 0.2 to 0.6 g of diuron per square metre are very effective in seed beds or for nursery plants. Inorganic phosphorous and potassium usually increase in the soil after herbicide application.

For individual plants, hand cultivation is usually done in February by clearing grass and other weeds below the trees and preparing the basin by light working of soil without causing root injury. All the weeds of the entire orchards should be cut during July-August in sodculture. Mulching should be done with dry grasses near the tree base to conserve soil moisture during October-November.

Pruning and Training

Citrus usually does not require much a proper framework is developed after planting. After 6 months to 1 year from the date of planting, 4-5 well shaped branches spread on all the four sides are retained and others cut at their bases 20-25 cm above ground level in case of seedling trees, while 5-7 cm above bud union in case of budded plants. These branches help in increasing the diameter of the trunk and also provide shade to protect the bark of the trunk against sun scald. All the suckers and sprouts should be pruned off to avoid nutrients loss by them, during vegetative as well as reproductive phases. In bearing trees, diseased branches, cross limbs, shoots on which *Loranthus* parasites or other creepers are growing, should be removed carefully without disturbing the balance of tree, one month before the commencement of normal flowering season. The pruning wound should be covered with Bordeaux paste to avoid rotting. Since the fruiting branch declines in productivity after the second or third year, proper balance is maintained by the production of a moderate amount of new branches at a uniform rate each year. This can be achieved by pruning the declining old fruiting wood.

Manuring

Citrus trees require heavy manuring, but in the north eastern region, it is very much neglected. Lack of proper manuring in mandarin orange plantations is one of the main reasons for low production as well as decline of orchards. Organic manuring is a better way of feeding the citrus plants than chemical fertilizers. A balanced dose of nutrients should be given to bearing trees (400-600 g of nitrogen, 350-400 g of phosphorous and 400-600 g of potassium along with 25-30 kg of farm yard manure per tree around the base for average production of 400-500 fruits per tree of mandarin orange and sweet orange depending upon the nutrients status of the soil). Farm yard manure and fertilizers should be applied in March-April, provided sufficient moisture is present in the soil.

Chemical fertilizers with half dose of nitrogen and full dose of potassium and phosphorous is mixed in the soil after 15-20 days of farm yard manure application. In high rainfall areas, it is advisable to apply the fertilizers at least in two split doses, one in February-March and another in August-September.

Similarly, the response of micro-nutrients on the declined trees is also found to be encouraging in this region. Therefore, regular spraying of micro-nutrients is essential for normal growth and production of citrus fruits, especially of those nutrients which are deficient in acid soils. These micro-nutrients can be applied in April-May along with half dose of nitrogen in spray form at the rate of 2 percent urea, 0.5 percent zinc sulphate, 0.1 percent boric acid, 0.2 percent magnesium sulphate, 0.3 percent copper sulphate and 0.2 percent sodium molybdate.

A smaller dose of these nutrients (250-300 g N, 200-250 g P²O and 250-300 g KO) is required for other citrus fruits also. Liming is also beneficial to citrus, especially in this region because of its acidic soil. Lime can also be sprayed along with other nutrients but in the long run basal application is more beneficial at the rate of 500-800 g per plant.

Cropping

Seedling trees of mandarin orange come into bearing within 6 to 8 years of planting. Production in budded plants is allowed to begin after 4-5 years. The bearing span of mandarin orange varies from 25-30 years in budded plants. However, plants from seedlings may produce for a period of 40-50 years.

Application of gibberellic acid (GA) during the period of flora initiation in a season when a heavy blossoming is expected reduces the number of flowers and increases better fruit set, which further helps in regulating the next crop. This approach seems to be highly acceptable. Commercial flower thinning can be done by spraying of GA at 100-300 ppm in the pre-blossom and 50-100 ppm in the post blossom period. Mandarin orange start flowering in March in this region and fruits ripen in about nine months after flowering in November and December in the warmer hills, while in the colder high altitudes of Meghalaya, fruit harvesting is delayed by about 2-3 months.

Mandarin should be harvested as soon as it is ripe, when it begins to change its colour from green to orange, sweet orange is harvested when it develops a yellow or pale colour, have at least 8 percent sugars, though acidity in most of the varieties varies from 0.3 percent to 0.8 percent. TSS/acid ratio is considered to be fairly good index of maturity in most of the citrus fruits. This ratio is supposed to be 12:1 and 14:1 respectively for inner and outer fruits. Juice content should not be less than 42 percent. Limes and lemons are harvested when mature but still green, so that their acidity is of the highest level. Citrus fruits are generally harvested with the help of clippers. Stems of the fruits should be clipped close to the skin with a clipper to avoid damage to other fruits. A prime quality fruit shows a balanced ratio between the sugar and acid contents. Since sugar content increases when the fruits mature on the tree, picking should be done as late as possible. The quality of fruit juice is also improved at full maturity. This quality remains constant for some time and then decreases until the fruit is almost dry. Application of 500-1000 ppm of ethep is also helpful for ripening of fruits as well as for better colour development, but it also leads to decay.

Lemons yellow in colour fetch a better price, and this can be obtained within 2 days by dipping harvested fruits in Ethepon at a concentration of 1000 ppm. 50 ppm Ethepon has been found to be optimum for ripening grapefruit and orange.

Ripe fruits are best stored in a cold storage for a period of 3-4 months.

J) Uniqueness:

Mandarins include a diverse group of citrus fruits that are characterized by bright coloured peel and pulp, excellent flavour, easy-to-peel rind and segments that separate easily.

Following are the distinguishing features of Khasi Mandarin:

- Fruit large, globose to moderately oblate; base commonly with strong furrowed but relatively short neck or low collar; apex usually deeply depressed and with radiating furrows; sometimes with navel.
- Rind medium-thick, fairly loosely adherent; surface relatively smooth but pebbled, with prominent, sunken oil glands; orange-colored at maturity. Segments about 10, easily separable; axis large and hollow.
- Flesh colour orange; tender and melting, juicy; flavor mild and pleasant, and aromatic.
- Seeds few, small, plump, and polyembryonic; cotyledons light green.
- Loses quality and rind puffs if not picked when ripe.
- Tree commonly vigorous and distinctive in appearance because of pronounced upright growth habit.
- Mandarins are rich in Ascorbic acid (13 – 54 mg per 100 g of edible portion) and Calcium (25 – 46 mg per 100 g of edible portion). They are a great source of Vitamin C.
- One orange actually has all the Vitamin C that one needs for the day. The water content in the fruit is nearly 80 per cent to 90 per cent of edible portion. The chemical composition of the Mandarin is as under.

K) Inspection Body:

Internal Watchdog mechanism

The quality of Meghalaya Khasi Mandarin will be monitored by internal watchdog mechanism in order to maintain the original physical and chemical characteristics as per GI registration by the following committee members

- i) Producer groups of Meghalaya
- ii) Horticulture department officers
- iii) Representative of NERAMAC in Meghalaya

This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. The committee will frame the terms and conditions to use brand name of GI registered Khasi Mandarin by any of the marketing agency. The logo of Khasi mandarin will be used to create brand image of GI registered produce.

Regulation of GI in the territory

To regulate the use of GI in the territory, the Inspection Structure is proposed to consist the following members:

- Senior Scientist from ICAR Institute
- Director of Horticulture, Government of Meghalaya
- Farmer Member

- Managing Director or his representative, NERAMAC

Khasi Mandarin in the geographical production area will be identified and will be allotted an identification number to ensure traceability and quality.

M) Others:

Uses of Khasi Mandarin

The Mandarins are having the following uses.

- **Use for kindling:** Dried Mandarin and lemon peels are a far superior choice for use as kindling than newspaper. Not only do they smell better and produce less creep up than newspaper, but the flammable oils found inside the peels enable them to burn much longer than paper.
- **As a pomander:** Pomanders have been used for centuries to fill small spaces with a delightful fragrance as well as to combat moths. They are also incredibly easy to make. Take a bunch of cloves and stick them into a Mandarin peel, covering the whole surface. Now suspend pomander using a piece of string, twine, or monofilament fishing line inside a closet or cupboard, and it will keep the space smelling fresh for years.
- **Simmer for stovetop potpourris:** Houses can be filled with a refreshing citrus scent by simmering several Mandarin peels in 1-2 cups of water in an aluminium pot for a few hours.
- Add water as needed during the simmering. This process freshens up the pot as well as the air in houses.
- **Keeps kitties off lawn:** The littering problems of cats can be solved by making a mixture of Mandarin peels and coffee grounds and distributing it around the cats' "*old haunts*" If they don't take the hint, lay down a second batch and try moistening it with a bit of water.
- **As mosquito repellent:** Mosquitoes and gnats are totally repulsed by scent of the orange peel.
- **As ants repellent:** In a blender, make a smooth puree of a few Mandarin peels in 1 cup warm water. Slowly pour the solution over and into anthills to send the little pests packing. This will help in to get rid of the ants in garden, on terrace, and along the foundation of house.

As Essential Oils: Three essential oils are obtained from Mandarins

- i) Oil of orange, obtained from the rind of the fruit and used principally as a flavouring agent
- ii) Oil of petgrain, obtained from the leaves and twigs and used in perfumery
- iii) Oil of neroli, obtained from the blossoms and used in flavourings and perfumes.

Other Uses

- **Pulp:** Citrus pulp (3/4 being a by-product of orange juice extraction) is highly valued as pelleted stock feed with a protein content of 6.58 to 7.03%. It is a source of edible yeast, non-potable alcohol, ascorbic acid, and hesperidin.
- **Peel:** In addition to its food uses, Mandarins peel oil is a prized scent in perfume and soaps. Because of its 90-95% limonene content, it has a lethal effect on houseflies, fleas and fire ants. Terpenes extracted from the outer layer of the peel are important in resins and in formulating paints.

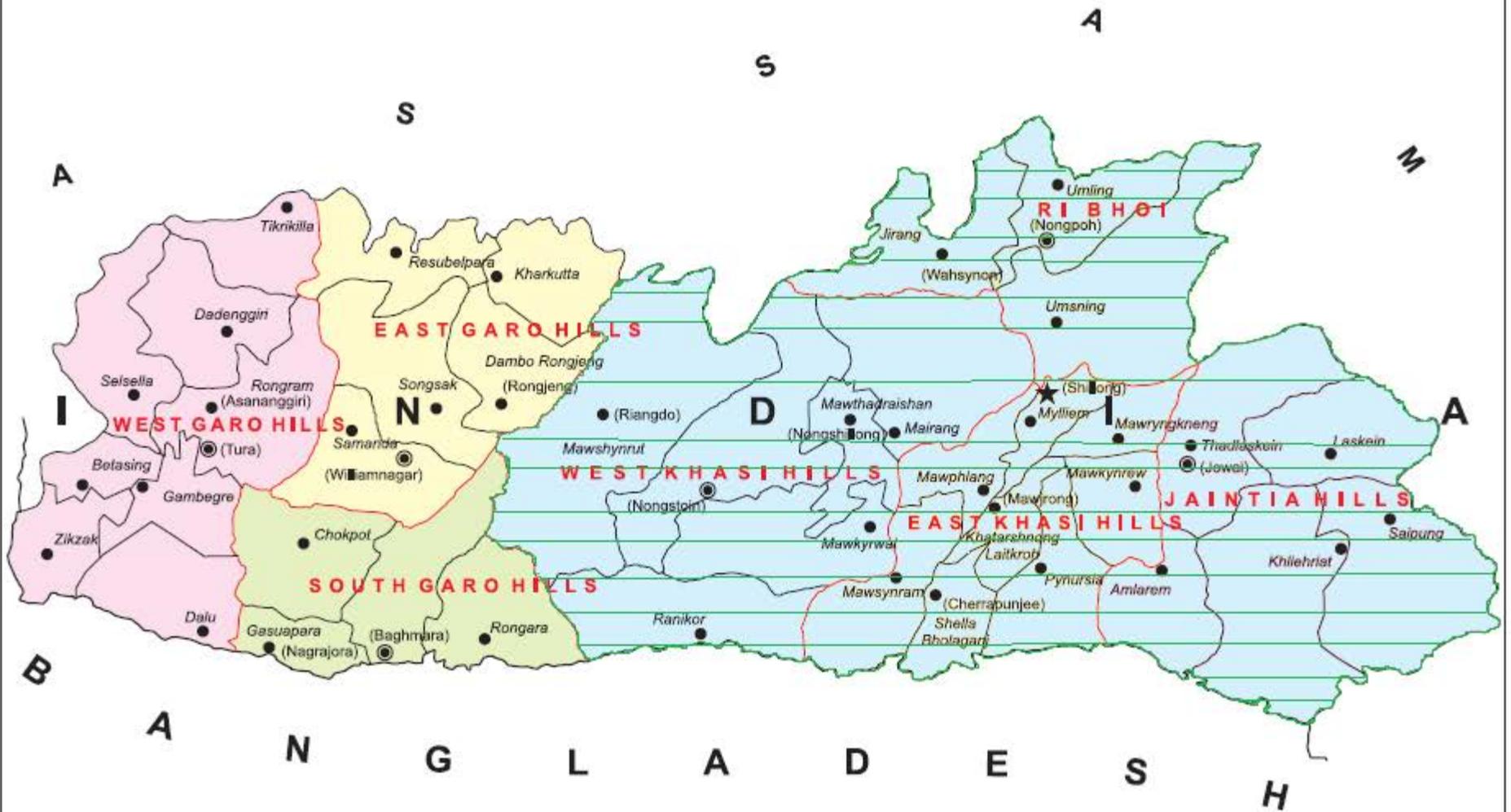
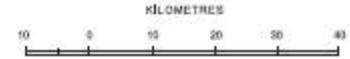
- **Seeds:** Oil derived from Mandarins and other citrus seed is used as cooking oil and in preparation soap as well as in plastic industry. The high-protein seed residue is suitable for human food and an ingredient in cattle feed, and the hulls enter into fertilizer mixtures.
- **Flowers and foliage:** The essential oils distilled from Mandarin flowers and foliage is important in perfume manufacturing. The oil is distilled from the leaves, flowers, twigs, and small, whole, unripe fruits.

Medicinal Uses

- Mandarins are eaten to allay fever and catarrh. The roasted pulp is prepared as a poultice for skin diseases. The fresh peel is rubbed on acne. Whole Mandarins are much useful because of its protopectin, bioflavonoids and inositol (related to vitamin B).
- Mandarin contains a significant amount of the vitamin-like glucoside, hesperidin, and 75-80% of it in the albedo, rag and pulp. An infusion of the immature fruit is taken to relieve stomach and intestinal complaints.
- The inner bark, macerated and infused in wine is taken as a tonic and carminative. A vinous decoction of husked orange seeds is prescribed for urinary ailments in China and the juice of fresh Mandarin leaves or a decoction of the dried leaves may be taken as a carminative or emmenagogue or applied on sores and ulcers.
- Mandarin seed extract is given as a treatment for malaria in Ecuador, but it is known to cause respiratory depression and a strong contraction of the spleen.
- Citrus fruits are notable for their fragrance, partly due to flavonoids and limonoids (which in turn are terpenes) contained in the rind, and most are juice-laden. The juice contains a high quantity of citric acid giving them their characteristic sharp flavour. The genus is commercially important as many species are cultivated for their fruit, which is eaten fresh, pressed for juice, or preserved in marmalades and pickles. They are also good sources of vitamin C and flavonoids. The flavonoids include various flavones and flavones.

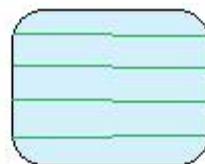
Geographical Area of Production of Khasi Mandarin

MEGHALAYA



BOUNDARIES:

- INTERNATIONAL.....
- STATE.....
- DISTRICT.....
- C.D.BLOCK.....



Geographical Area of Production of Khasi Mandarin

HEADQUARTERS:

- STATE.....
- DISTRICT.....
- C.D.BLOCK.....

Meghalaya Khasi Mandarin production area lies between 25⁰¹' and 26⁰⁵' North latitudes and 85⁰⁴⁹' and 92⁰⁵²' East Longitudes.

G.I. APPLICATION NUMBER - 466

Application Date: 10-12-2013

Application is made by **North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC)**, 9, Rajpari Path, Ganeshguri, G S Road, Guwahati - 781005, Assam, India for Registration in Part A of the Register of **Kachai Lemon** under Application No - 466 in respect of Horticulture products (Fruits) – Lemon, falling in Class - 31 is hereby advertised as accepted under Sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- A) Name of the Applicant** : North Eastern Regional Agricultural Marketing Corporation Ltd, (NERAMAC)
- B) Address** : North Eastern Regional Agricultural Marketing Corporation Limited, (NERAMAC), No.9, Rajpari Path, Ganeshguri, G.S. Road, Guwahati - 781005, Assam, India
- C) Types of Goods** : **Class 31 - Horticulture products (Fruits) – Lemon**
- D) Specification:**

Kachai lemon, is a high yielding landrace of lemon, also known as Champra is grown extensively in the surrounding areas of Kachai village in Ukhrul District of Manipur. Kachai lemon fruits are spheroid in shape and the individual fruit weight ranges from 70 to 100 g. Fruits are yellow in colour.

Kachai lemon fruits have 9-10 segments and 15-18 seeds per fruit. The rind colour is white and the pulp colour is yellow. The juice content per fruit varies from 30 to 60 ml. The TSS content is 6.8 -9.0 per cent. The acidity of the juice is 4.1 – 5.8 per cent. The ascorbic acid content of the juice is 46-51mg/100 ml juice.

The morphological and physico-chemical characteristics of Kachai Lemon is mentioned below:

Parameters	Range
Plant height	3-4 m
Average plant age	30 year
No. of fruits/plant (age 10-20 years)	1,000 – 3,000
Yield potential	70-80 ton/ha
Fruit weight	70-100 g
Polar diameter	52-55 mm
Equatorial diameter	56-59 mm
Peel thickness	1.9 – 3 mm
Juice content per fruit	30-60 ml
Juice(%) by weight	37-57%
Segments/Fruit	9/10
Seeds/Fruit	15 - 18
TSS	6.8 – 9.0 %

pH	2.87-
Acidity	4.1 – 5.8 %
Ascorbic acid	46-51mg/100 ml juice
Fruit shape	Spheroid
Fruit colour	Yellow

E) Name of the Geographical Indication:

KACHAI LEMON



F) Description of the Goods:

Order:	Sapindales
Family:	Aurantioideae
Genus:	Citrus
Species:	Jambhiri
Scientific name:	<i>Citrus jambhiri</i>
Local name:	Kachai lemon
Common name:	Rough lemon
Habitat:	Hill

Morphology

(a) Leaf:

Division	simple
Lamina Shape	Elliptic
Lamina Length	8.99 cm
Lamina Width	4.54 cm
Lamina Attachment	brevipetiolate
Margin	Sinuate
Apex	Acute
Petiole Length	1.47 cm
Petiole Wing	Present
Petiole Wing Wide	Narrow
Petiole Wing Shape	Obdeltate
Junction Between Petiole and Lamina	Articulate

(b) Fruit:

Weight	107.42 gm
Diameter	8.58 cm
Length	5.82 cm

Shape	Spheroid
Base Shape	Convex
Apex Shape	Rounded
Skin Texture	rough
Segment	10.33 nos.
Segment Shape Uniformity	Present
Rind Colour	White
Rind Thickness	0.48 cm
Pulp Color	Yellow
Pulp Color Intensity	light to medium
Axis	Hollow
Axis Shape	circular to irregular
Axis Diameter	2.7 cm
Oil Density (sq.cm)	58.23
Oil Gland Nature	Conspicuous
Areola	Present
Areola Diameter	3.78 cm
Style Scar	Absent

c) Seed:

Shape	Cuneiform
Surface	Smooth
Color	White
Length	1.22 cm
Width	0.51 cm
Cotyledon Colour	White
Average Seeds	14-23

Kachai lemon, is a high yielding landrace of lemon, also known as Champra is grown extensively in the surrounding areas of Kachai village in Ukhrul District of Manipur. The fruits of this landrace of lemon have high economic value .It is consumed as fresh fruit and also used for making juice and pickles. Kachai lemon fruits are spheroid in shape and the individual fruit weight ranges from 70 to 100 g. Fruits are yellow in colour. The polar diameter and equatorial diameter of the fruits ranges from 52 to 55 mm and 56 to 59 mm respectively. The peel thickness varies from 1.9 to 3.0 mm. The skin of the fruit is rough. Kachai lemon fruits have 9-10 segments and 15-18 seeds per fruit. The rind colour is white and the pulp colour is yellow .The juice content per fruit varies from 30 to 60 ml. The TSS content is 6.8 -9.0 per cent. The acidity of the juice is 4.1 – 5.8 per cent. The ascorbic acid content of the juice is 46-51mg/100 ml juice.

Uses:

- Kachai Lemon is a high yielding landrace with high economic value, consumed as fresh fruit, used for making juice and pickles.
- Citrus is consumed fresh, juiced, and processed. The most nutritious ways of serving citrus are as fresh fruit or fresh-squeezed juice. Citrus fruits are well known for their vitamin C content, but are also good sources of vitamin A, folic acid, and dietary fiber.
- Fresh citrus fruits can be stored for several days at room temperature or for several weeks in the refrigerator. Fresh-squeezed juice should be stored in the refrigerator and is stable at refrigerator temperatures for several weeks from a nutritional

standpoint. However, there is often a loss of quality when fresh-squeezed juice is stored. This is especially true of navel orange juice.

G) Geographical area of Production and Map as shown in page no.: 42

Kachai Lemon is commercially grown in Kachai area of Ukhrul district, Manipur. Kachai lemon is commonly grown in the fertile soil, depending on natural resources, decomposed materials etc.

The Kachai village is located at extreme west in Ukhrul District, boundary with Senapati district, Manipur. The village is about 140 km away from Imphal and 50 km from Ukhrul District Headquarters. It is the highest lemon producer village in Manipur state.

The climate of Kachai Area is subtropical, characterized by coolness and extreme humidity. The mean annual temperature ranges from 19° to 21°C and rainfall varies from 1,300 to 1,500 mm. Water is the scarcest commodity during winter months in hill region. However, that plants survive mainly due to heavy fog in winter, as the entire Kachai area remains covered by thick fog upto 10 am in the morning in winter.

Kachai Lemon production area lies between 24⁰ - 25⁰ 41' North latitudes and 94⁰ - 94⁰ 47' East Longitudes.

H) Proof of Origin (Historical records):

Tanaka reported that there were two forms of Rough lemon (*Citrus jambhiri* Lush) in Assam (undivided Assam) which indicates that the species is native to this region. *Citrus jambhiri* Lush is reported to be endemic to India and mention has been made that it grows in many parts of Assam. It was reported that *C. jambhiri* Lush is indigenous to North Eastern region of India this landrace of lemon locally called as Kachai lemon (*Citrus jambhiri* Lush.) or Champra is grown extensively in the surrounding areas of Kachai village in Ukhrul District of Manipur. The district is blessed with all important prerequisites for the successful cultivation of Kachai Lemon.

The fruit was first introduced by Late S. Paisho during 1944-45 and later on its cultivation spread to other neighboring villages. During early 70s of the last century, Shri S. Bhowmik, Advisor of Agriculture, Govt. of Manipur named it as Kachai Lemon. Tracing the origin of Kachai lemon, late S Paisho brought and planted three lemon seeds at Theikhor and another two at Shimpungrim of Kachai in 1944-45. Of these, two grew up at Theikhor and one at Shimpungrim and these plants became fully matured in 1950. By and by, the same variety of lemon spread to every household of Kachai.

In order to popularize and increase production similar to orange festival of Tamenglong, Kachai Lemon Festival was introduced by Manipur Small Farmers' Agri-Business Consortium jointly with Indian Council Agriculture Research Centre ICAR Centre Manipur since 2005 at Kachai Village. Since then it has become a regular feature of Kachai Lemon Festival.

The harvesting of Kachai Lemon starts from November and it continues till the months of April. Every year during the months of harvesting in January Kachai Lemon Festival is celebrated with the following objectives:

- Conducting meeting with Buyers and Growers is done to popularize the crop.

- Transfer of technology to the growers.
- Prices are decided by the department of Agriculture.
- Growers are encouraged to have an expansion of area of cultivation for Kachai lemon.

I) Method of Production:

The package of practices for Kachai Lemon is described as below:

Soil and climate

Kachai lemon can grow successfully in all areas of free from frost, hailstorm and extreme fluctuation of temperature in winter. They are adapted to sub-mountainous tracts up to 700-1200 m above msl and temperature at about 10-35⁰C.

Deep well sandy loam soil with sub soil free from any hard pan, low water table are suitable for its cultivation.

Site selection

The planting site/area should be always facing directly towards the sun. Steep slopes are not suitable for making orchard. After selecting the suitable site for orchard, the site must be cleared of all trees and shrubs.

Land preparation

Large pieces of roots as well as small roots should be removed from the upper 6 cm of soil. On the slope, contour system of planting should be done. It is desirable to make bench terraces or half-moon terraces may be made in such a way that water should not stagnate during rainy season.

Propagation

Propagated by seed or T-budding or shield budding. Budding should be done in the month of March-April or August-September. The plant may be buddable when the plants attain 6-12 months after transplanting. The best size of scion is pencil thickness and budding should be done at 20 cm above the ground level. Budded plants ensures true to type, uniform quality, regular and early bearing. Seedling plants of lemon are commonly used in North Eastern Hill regions.

Planting System

Contour system of planting should be followed on hill slopes. Transplanting should be done with a spacing of 6 m x 6 m in square system (275 plants/ha). Dig the pits of 50cm x 50 cm x 50 cm size prior to the commencement of monsoon and fill with a mixture of 10 kg FYM or well decomposed pig dung manure along with the top soil of pit before the soil of pit before the onset of monsoon.

Manures and Fertilizers

Age of plantation	FYM (kg/plant)	UREA (g/plant)	SSP (g/plant)	MOP (g/plant)
1 st Year	5	200	500	200
2 nd Year	10	400	700	400
3 rd Year	15	600	1000	500
4 th Year	20	800	1200	600
5 th year	25	850	1400	600

6 th Year	30	1000	1500	700
7 th Year	30	1100	1600	800
8 th Year	30	1100	1600	800

These equal split doses of fertilizers coinciding with the flush period are applied. The first dose may be applied in the month of March-April and subsequent split doses may be given in June-July and Sept-Oct. fertilizers should be applied around the skirt belt of the soil under the plant. Application of Dolomite lime @ 3 kg/plant/year within the skirt belt of tree or below the perimeter of tree is recommended to improve the soil pH.

Micronutrient

Copper sulphate 100 g and Zinc sulphate 200 g per bearing tree may be applied preferably in the month of April after fruit set under the presence of sufficient soil moisture.

Intercropping

Leguminous crops like pea, cow pea, beans, rice beans can safely be grown in lemon orchards. Papaya and pineapple can be grown in between the rows to get additional income during pre-bearing stage.

Care of the Plant

- Remove new shoots arising from stem regularly up to 30-45 cm from the ground
- Prune dried and undesirable shoots regularly
- Avoid deep digging around the young bearing plants
- Keep the basin free from the weeds and mulch with dry grasses during dry months.
- Paste the trunk with Bordeaux paste during winter up to 60 cm from the ground.

J) Uniqueness:

Kachai Lemon is unique in its characteristics. The bearing plants of Kachai Lemon look like flowering trees during harvesting time. The main fruiting time starts from November and continues till April. The fruit is a rich source of Ascorbic Acid, containing 46-51 mg/100 ml juice. The juice content is 36-60 ml per fruit. The distinguishing features of Kachai lemon are described below:

- Kachai lemons contain 46 to 51 percent of Ascorbic Acid (Vitamin C)
- On the average, one fully ripe Kachai lemon weighs up to 101 g with a circumference in the range about 66-69 mm.
- Each lemon plant produces at least four tins of lemon in a season.
- Very Juicy
- Flavor of Kachai lemon is different from other Lemon varieties.
- Sweet aroma of "Lemon"
- Rich ascorbic acid content up to 70 to 80 percent. Other Lemon varieties have only 20 to 30 percent of ascorbic acid
- The Kachai Lemon juice- unique and delicious as nature intended, more refreshing, more healthy, naturally grown and chemical free.
- Taste Blended (Sweet + Sour)
- The uniqueness of the fruit lies in its bearing habit. Even if it gets ripened it doesn't fall from the tree. Fruit will become small and turns into green from yellow, and then it grows again in the next fruiting season.
- Some inner physiological changes take place inside which turns its color from yellow to green but it never falls from its "**Mother Plant**".

- Some other special features of Kachai lemon are:
- The bearing plants of Kachai Lemon look like flowering trees during harvesting time, simply beautiful, colorful and attractive to everyone.
- The main fruiting time starts from November and continues till April. Fruits are available throughout the year. It is interesting that the unplucked fruits remain on the tree and the fruits change its colour in next fruiting season (green to yellow).
- The uniqueness and speciality of Kachai Lemon is that it is a *rich source of Ascorbic Acid, containing 45-51 mg/100ml juice*. The juice content is 36-56 ml per fruit.

K) Inspection Body:

Internal Watchdog Mechanism

The quality of Kachai Lemon will be monitored by internal watchdog mechanism in order to maintained the original physical and chemical characteristics as per GI registration by the following committee members

- i) Producer groups of Manipur
- ii) Horticulture department officers
- iii) Representative of NERAMAC in Manipur

This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. This committee will also help regulate the use of Geographical Indications for the welfare of local farming community. The committee will frame the terms and conditions to use brand name of GI registered Kachai Lemon by any of the marketing agency. The logo of Kachai Lemon will be used to create brand image of GI registered produce.

Regulation of GI in the territory

To regulate the use of GI in the territory, the Inspection Structure is proposed to consist the following members:

- Senior Scientist from ICAR Institute
- Director of Horticulture, Government of Manipur
- Farmer Member
- Managing Director or his representative, NERAMAC

Kachai Lemon in the geographical production area will be identified and will be allotted an identification number to ensure traceability and quality.

Geographical Area of Production of Kachai Lemon

MANIPUR



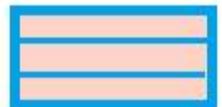
- IMPHAL WEST**
1. Lamshang
 2. Patsol
 3. Lamphelpat
 4. Wangoi

- IMPHAL EAST**
1. Jiribam
 2. Sawombung
 3. Porompat
 4. Keirao Bitra

S - SENAPATI

BOUNDARIES:

- INTERNATIONAL.....
- STATE.....
- DISTRICT.....
- SUB-DIVISION.....



Geographical Area of Production of Kachai Lemon

HEADQUARTERS:

- STATE.....★
- DISTRICT.....●
- SUB-DIVISION.....●

Kachai Lemon production area lies between 24° - 25° 41' North latitudes and 94° - 94° 47' East Longitudes.

**G.I. Authorised User Application No. - 1916 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Maajhdia International**, Represented by Smt. Sharmila Mukherjee, C-5, Chandra Residency, Hukulganj, Varanasi - 221002, Uttar Pradesh, India dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- (A) **Applicant** : M/s. Maajhdia International, Represented by Smt. Sharmila Mukherjee
- (B) **Address** : M/s. Maajhdia International, Represented by Smt. Sharmila Mukherjee
C-5, Chandra Residency, Hukulganj,
Varanasi - 221002, Uttar Pradesh, India
- (C) **Date of Authorised User Application** : April 28, 2014
- (D) **Registered Geographical Indication** : **Hand Made Carpet of Bhadohi**



- (E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries
- (F) **Address** : 1. All India Carpet Manufacturer's Association,
Maryadpatti, PB.No.63, Bhadohi – 221 401,
District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society,
Chakkishundas (Kawal), Gyanpur, District:
S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries,
Office of Joint Director Industries,
Government of Uttar Pradesh, Varanasi
Region, Varanasi, Uttar Pradesh, India
- (G) **Class** : 27
- (H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1917 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Priya Exports**, Represented by Mr. Puneet Raman, Raman Niwas, Mahmooorganj, Varanasi - 221010, Uttar Pradesh, India, dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- (A) **Applicant** : M/s. Priya Exports, Represented by
Mr. Puneet Raman
- (B) **Address** : M/s. Priya Exports, Represented by
Mr. Puneet Raman,
Raman Niwas, Mahmooorganj,
Varanasi - 221010, Uttar Pradesh, India
- (C) **Date of Authorised
User Application** : April 28, 2014
- (D) **Registered Geographical
Indication** : **Hand Made Carpet of Bhadohi**



- (E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries
- (F) **Address** : 1. All India Carpet Manufacturer's Association,
Maryadpatti, PB.No.63, Bhadohi – 221 401,
District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society,
Chakkishundas (Kawal), Gyanpur, District:
S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries,
Office of Joint Director Industries,
Government of Uttar Pradesh, Varanasi
Region, Varanasi, Uttar Pradesh, India
- (G) **Class** : 27
- (H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1918 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Shilpi International**, Represented by Mr. Anurag Chandra, S.2/638 A. Club Road, Rai Krishna Chandra Nagar, Varanasi - 221002, Uttar Pradesh, India, dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

(A) **Applicant** : M/s. Shilpi International, Represented by
Mr. Anurag Chandra

(B) **Address** : M/s. Shilpi International, Represented by
Mr. Anurag Chandra,
S.2/638 A. Club Road, Rai Krishna
Chandra Nagar, Varanasi - 221002,
Uttar Pradesh, India

(C) **Date of Authorised
User Application** : April 28, 2014

(D) **Registered Geographical
Indication** : **Hand Made Carpet of Bhadohi**



(E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries

(F) **Address** : 1. All India Carpet Manufacturer's Association,
Maryadpatti, PB.No.63, Bhadohi – 221 401,
District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society,
Chakkishundas (Kawal), Gyanpur, District:
S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries,
Office of Joint Director Industries,
Government of Uttar Pradesh, Varanasi
Region, Varanasi, Uttar Pradesh, India

(G) **Class** : 27

(H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1919 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Mahesh Carpets**, Represented by Mr. Maniessh Maheshwari, Jagatpur, SBI Compound, G.T. Road, Varanasi - 221313, Uttar Pradesh, India dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- (A) **Applicant** : M/s. Mahesh Carpets, Represented by Mr. Maniessh Maheshwari
- (B) **Address** : M/s. Mahesh Carpets, Represented by Mr. Maniessh Maheshwari, Jagatpur, SBI Compound, G.T. Road, Varanasi - 221313, Uttar Pradesh, India
- (C) **Date of Authorised User Application** : April 28, 2014
- (D) **Registered Geographical Indication** : **Hand Made Carpet of Bhadohi**



- (E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries
- (F) **Address** : 1. All India Carpet Manufacturer's Association, Maryadpatti, PB.No.63, Bhadohi – 221 401, District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society, Chakkishundas (Kawal), Gyanpur, District: S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries, Office of Joint Director Industries, Government of Uttar Pradesh, Varanasi Region, Varanasi, Uttar Pradesh, India
- (G) **Class** : 27
- (H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1920 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Maurya Carpet Industries**, Represented by Mr. Chandramani Maurya, Village: Madhaipur, Post: Khamaria - 221306, District: Bhadohi, Uttar Pradesh, India dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- (A) **Applicant** : M/s. Maurya Carpet Industries, Represented by Mr. Chandramani Maurya
- (B) **Address** : M/s. Maurya Carpet Industries, Represented by Mr. Chandramani Maurya, Village: Madhaipur, Post: Khamaria - 221306, District: Bhadohi, Uttar Pradesh, India
- (C) **Date of Authorised User Application** : April 28, 2014
- (D) **Registered Geographical Indication** : **Hand Made Carpet of Bhadohi**



- (E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries
- (F) **Address** : 1. All India Carpet Manufacturer's Association, Maryadpatti, PB.No.63, Bhadohi – 221 401, District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society, Chakkishundas (Kawal), Gyanpur, District: S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries, Office of Joint Director Industries, Government of Uttar Pradesh, Varanasi Region, Varanasi, Uttar Pradesh, India
- (G) **Class** : 27
- (H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1921 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. B.W.M International**, Represented by Mr. Raj Kumar Bothra, Meumann Villa, Rajpura By-Pass Road Rajpura, Bhadohi, S.R.N. - 221401, Uttar Pradesh, India dated April 28, 2014 for Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

(A) **Applicant** : M/s. B.W.M International, Represented by
Mr. Raj Kumar Bothra

(B) **Address** : M/s. B.W.M International, Represented by
Mr. Raj Kumar Bothra,
Meumann Villa, Rajpura By-Pass Road
Rajpura, Bhadohi, S.R.N. - 221401,
Uttar Pradesh, India

(C) **Date of Authorised
User Application** : April 28, 2014

(D) **Registered Geographical
Indication** : **Hand Made Carpet of Bhadohi**



(E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries

(F) **Address** : 1. All India Carpet Manufacturer's Association,
Maryadpatti, PB.No.63, Bhadohi – 221 401,
District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society,
Chakkishundas (Kawal), Gyanpur, District:
S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries,
Office of Joint Director Industries,
Government of Uttar Pradesh, Varanasi
Region, Varanasi, Uttar Pradesh, India

(G) **Class** : 27

(H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1922 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Patodia Carpets**, Represented by Mr. Parmanand Patodia, Maryadpatti, Bhadohi - 221401, Uttar Pradesh, India dated April 28, 2014 Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

(A) **Applicant** : M/s. Patodia Carpets, Represented by
Mr. Parmanand Patodia

(B) **Address** : M/s. Patodia Carpets, Represented by
Mr. Parmanand Patodia,
Maryadpatti, Bhadohi - 221401,
Uttar Pradesh, India

(C) **Date of Authorised
User Application** : April 28, 2014

(D) **Registered Geographical
Indication** : **Hand Made Carpet of Bhadohi**



(E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries

(F) **Address** : 1. All India Carpet Manufacturer's Association,
Maryadpatti, PB.No.63, Bhadohi – 221 401,
District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society,
Chakkishundas (Kawal), Gyanpur, District:
S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries,
Office of Joint Director Industries,
Government of Uttar Pradesh, Varanasi
Region, Varanasi, Uttar Pradesh, India

(G) **Class** : 27

(H) **Goods** : **Class 27 - Hand made Carpet**

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**G.I. Authorised User Application No. - 1923 in respect of Hand Made Carpet of Bhadohi
Registered GI Application No. - 148**

Application is made by, **M/s. Kerman International**, Represented by Mr. Mohammad Shafqat Imam Siddiqui, Chauri Road, Bhadohi - 221401, Uttar Pradesh, India dated April 28, 2014 Registration in Part-B for Authorised User in respect of Registered Geographical Indication **Hand Made Carpet of Bhadohi** under Application No - 148 in respect of Hand made Carpet falling in Class 27 is hereby advertised as accepted under sub-section (1) of Section 13 of Geographical Indications of Goods (Registration and Protection) Act, 1999.

- (A) **Applicant** : M/s. Kerman International, Represented by Mr. Mohammad Shafqat Imam Siddiqui
- (B) **Address** : M/s. Kerman International, Represented by Mr. Mohammad Shafqat Imam Siddiqui, Chauri Road, Bhadohi - 221401, Uttar Pradesh, India
- (C) **Date of Authorised User Application** : April 28, 2014
- (D) **Registered Geographical Indication** : **Hand Made Carpet of Bhadohi**



- (E) **Registered Proprietor** : 1. All India Carpet Manufacturer's Association
2. The Great Bhadohi Craft Society
3. Joint Director Industries
- (F) **Address** : 1. All India Carpet Manufacturer's Association, Maryadpatti, PB.No.63, Bhadohi – 221 401, District: S.R.N. Bhadohi, Uttar Pradesh, India.
2. The Great Bhadohi Craft Society, Chakkishundas (Kawal), Gyanpur, District: S.R.N. Bhadohi, Uttar Pradesh, India
3. Joint Director Industries, Office of Joint Director Industries, Government of Uttar Pradesh, Varanasi Region, Varanasi, Uttar Pradesh, India
- (G) **Class** : 27
- (H) **Goods** : **Class 27 - Hand made Carpet**

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General Information

What is a Geographical Indication?

- It is an indication,
- It is used to identify agricultural, natural, or manufactured goods originating in the said area,
- It originates from a definite territory in India,
- It should have a special quality or characteristics unique to the geographical indication.

Examples of possible Geographical Indications in India:

Some of the examples of Geographical Indications in India include Basmati Rice, Darjeeling Tea, Kancheepuram silk saree, Alphonso Mango, Nagpur Orange, Kolhapuri Chappal, Bikaneri Bhujia etc.

What are the benefits of registration of Geographical Indications?

- It confers legal protection to Geographical Indications in India,
- It prevents unauthorized use of a registered Geographical Indication by others.
- It boosts exports of Indian Geographical indications by providing legal Protection.
- It promotes economic Prosperity of Producers.
- It enables seeking legal protection in other WTO member countries.

Who can apply for the registration of a Geographical Indication?

Any association of persons, producers, organization or authority established by or under the law can apply.

The applicant must represent the interest of the producers.

The application should be in writing in the prescribed form.

The application should be addressed to the Registrar of Geographical Indications along with prescribed fee.

Who is the Registered Proprietor of a Geographical Indication?

Any association of persons, producers, organisation or authority established by or under the law can be a registered proprietor. Their name should be entered in the Register of Geographical Indications as registered proprietor for the Geographical Indication applied for.

Who is an authorized user?

A producer of goods can apply for registration as an authorized user, with respect to a registered Geographical Indication. He should apply in writing in the prescribed form along with prescribed fee.

Who is a producer in relation to a Geographical Indication?

A producer is a person dealing with three categories of goods

- Agricultural Goods including the production, processing, trading or dealing.
- Natural Goods including exploiting, trading or dealing.
- Handicrafts or industrial goods including making, manufacturing, trading or dealing.

Is registration of a Geographical Indication compulsory?

While registration of Geographical indication is not compulsory, it offers better legal protection for action for infringement.

What are the advantages of registering?

- Registration affords better legal protection to facilitate an action for infringement.
- The registered proprietor and authorized users can initiate infringement actions.
- The authorized users can exercise right to use the Geographical indication.

Who can use the registered Geographical Indication?

Only an authorized user has the exclusive rights to use the Geographical indication in relation to goods in respect of which it is registered.

How long is the registration of Geographical Indication valid? Can it be renewed?

The registration of a Geographical Indication is for a period of ten years.

Yes, renewal is possible for further periods of 10 years each.

If a registered Geographical Indication is not renewed, it is liable to be removed from the register.

When a Registered Geographical Indication is said to be infringed?

- When unauthorized use indicates or suggests that such goods originate in a geographical area other than the true place of origin of such goods in a manner which misleads the public as to their geographical origins.
- When use of Geographical Indication results in unfair competition including passing off in respect of registered Geographical indication.
- When the use of another Geographical Indication results in a false representation to the public that goods originate in a territory in respect of which a Geographical Indication relates.

Who can initiate an infringement action?

The registered proprietor or authorized users of a registered Geographical indication can initiate an infringement action.

Can a registered Geographical Indication be assigned, transmitted etc?

No, A Geographical Indication is a public property belonging to the producers of the concerned goods. It shall not be the subject matter of assignment, transmission, licensing, pledge, mortgage or such other agreement. However, when an authorized user dies, his right devolves on his successor in title.

Can a registered Geographical Indication or authorized user be removed from the register?

Yes, The Appellate Board or the Registrar of Geographical Indication has the power to remove the Geographical Indication or authorized user from the register. The aggrieved person can file an appeal within three months from the date of communication of the order.

How a Geographical Indication differs from a trade mark?

A trade mark is a sign which is used in the course of trade and it distinguishes goods or services of one enterprise from those of other enterprises. Whereas a Geographical Indication is used to identify goods having special characteristics originating from a definite geographical territory.

THE REGISTRATION PROCESS

In December 1999, Parliament passed the Geographical Indications of Goods (Registration and Protection) Act 1999. This Act seeks to provide for the registration and protection of Geographical Indications relating to goods in India. This Act is administered by the Controller General of Patents, Designs and Trade Marks, who is the Registrar of Geographical Indications. The Geographical Indications Registry is located at Chennai.

The Registrar of Geographical Indication is divided into two parts. Part 'A' consists of particulars relating to registered Geographical indications and Part 'B' consists of particulars of the registered authorized users.

The registration process is similar to both for registration of geographical indication and an authorized user which is illustrated below:

