# Specifications for BASMATI

## The Applicant

This application for the registration of a name as a protected geographical indication within the terms of Regulation 1151/2012 is made by the Agricultural and Processed Food Products Export Development Authority of India (APEDA).

APEDA is a statutory body established under the Agricultural and Processed Food Products Export Development Authority Act, 1985 [duly amended as the Agricultural and Processed Food Products Export Development Authority (Amendment) Act, 2009], which provides for the development and promotion of export of certain agricultural and processed food products from India, including BASMATI rice. APEDA represents producers and exporters of a product with the geographical indication "BASMATI" and has its registered office at 3rd Floor, NCUI Building 3, Siri Institutional Area, August Kranti Marg, Opp. Asiad Village, New Delhi, Delhi 110016, India.

This is the government body that transmits the application on behalf of producers and traders.

APEDA is represented for the purposes of this application by Bernard O'Connor, partner in Nctm, a law firm, and Irina Kireeva, also of Nctm, having their offices at 1 Avenue de la Joyeuse Entrée, 1040 Brussels.

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## The name to be protected: BASMATI

The non-geographical name Basmati derives from two Sanskrit roots, 'Vas' meaning 'aroma' and 'Mati' meaning 'ingrained from the origin'. In Hindi, the equivalent of 'Vas' is 'Bas' and, therefore, Basmati. Essentially, Basmati means, 'the one containing aroma'.

Basmati rice is believed to have been cultivated in the Indian subcontinent for centuries. Basmati rice was introduced to the Middle East by Hindu

[1] Two sources of information are referring to this date: VP Singh (2000), Aromatic Rices. International Rice Research Institute, pp. 135–36, ISBN978-81-204-1420-4; Daniel F. Robinson (2010), Confronting Biopiracy: Challenges, Cases and International Debates, Earthscan, p. 47. ISBN 978-1-84977-471-0.

traders. The earliest extant work to mention Basmati rice is Heer Ranjha (1766).[1]

## The description of the product

Basmati is a special long grain aromatic rice grown and produced in a particular geographical region of the Indian sub-continent. In India, this region falls in a part of northern India, below the foothills of the Himalayas forming part of the Indo-Gangetic Plains (IGP).

The special characteristics of Basmati rice are its long slender kernels with high length-breadth ratio, an exquisite aroma, sweet taste, soft texture, delicate curvature, intermediate amylose content, high integrity of grain on cooking, and linear kernel elongation with least breadth-wise swelling on cooking. These special characteristics are attributable to the various natural and human factors involved in the sowing, harvesting and processing of Basmati rice.

The primary characteristics of Basmati rice are the following:

| S. No. | Parameter ** | Value |
|---|---|---|
| 1. | Minimum average precooked milled rice length (mm) | 6.61 |
| 2. | Average precooked milled rice breadth (mm) | ≤2.00 |
| 3. | Minimum length/breadth ratio of precooked milled rice (L/B Ratio) | 3.50 |
| 4. | Minimum average cooked rice length (mm) | 12.00 |
| 5. | Minimum cooked rice length/precooked rice length ratio OR Minimum elongation ratio | 1.70 |
| 6. | Average volume expansion ratio | >3.5 |
| 7. | Aroma | Present (Qualitative sensory analysis as Panel Test *) |
| 8. | Texture of cooked grain for high integrity (without bursting the surface), non-stickiness, tenderness, good taste and good mouth feel. | Present (Qualitative sensory analysis as Panel Test *) |

** The grain sample for analyses will necessarily have to be 'aged' for three months under protected conditions at normal room temperature as milled kernel.
*As per standardized protocol (Directorate of Rice Research, Hyderabad).

Basmati rice is grown from traditional and evolved Basmati rice plant varieties developed through breeding. The traditional varieties of Basmati rice are long duration varieties, which come to maturity in the month of October. The “photoperiod sensitivity” of traditional Basmati rice varieties makes these vulnerable to erratic climate, which sometimes reduces the productivity. Further, traditional Basmati rice varieties may be vulnerable to lodging. These limitations have been overcome to a great extent in the evolved varieties using scientific, genetic and plant breeding methodologies. The evolved varieties can withstand changes in the climate within the defined growing area. The evolved varieties come to maturity towards the end of September to the first half of October in the defined growing areas when the temperature is conducive for accumulation and retention of aroma during grain filling process. The evolved varieties come to harvesting stage about 20-30 days earlier than traditional varieties. Currently, there are a total of 30 notified varieties of Basmati rice under the Indian Seeds Act, 1966.

*Aroma*: Basmati rice emits a specific aroma in the field, at harvesting, in storage, during milling, cooking and eating. This aroma is due to a harmonious combination of more than 200 chemical compounds among which, 2-acetyl-1-pyroline is the most predominant. Basmati rice acquires this aroma, among other characteristics, as a result of the interplay of the longer light hours prevalent in the geographical area where it is grown, with other factors such as temperature, humidity and solar radiation in the said regions.

*Taste and mouth feel*: Cooked Basmati grains retain high integrity due to the low glycaemic index, which is typical of Basmati rice. The sweet taste and distinct mouth feel of cooked Basmati rice is due to various factors including such low glycaemic index and high integrity of the cooked grain. These characteristics are owing to the prolonged sunshine available due to the longer days in the flowering months of Basmati rice. Ageing and pre-soaking of the Basmati rice is known to enhance these characteristics even further.

The Directorate of Rice Research, Hyderabad, now known as the Indian Institute of Rice Research (IIRR) has laid down a protocol for testing the above mentioned organoleptic characteristics of Basmati rice.

## The Geographical Area

Basmati rice has been traditionally grown and produced in all parts of the states of Punjab, Haryana, Delhi, Himachal Pradesh, Uttarakhand, as well as in specific districts of western Uttar Pradesh and Jammu & Kashmir. The States of Punjab, Haryana and Himachal Pradesh were originally part of

the area known as Punjab.

In the State of Uttar Pradesh, Basmati Rice is grown in the following districts: Meerut; Bulandshahr; Gautam Buddha Nagar; Ghaziabad; Hapur; Baghpat; Saharanpur; Muzaffarnagar; Shamli; Moradabad; Bijnor; Rampur; Amroha; Sambhal; Bareilly; Badaun; Pilibhit; Shahjahanpur; Agra; Firozabad; Mainpuri; Mathur; Aligarh; Etah; Hathras; Kannauj; Etawah; Auraiya; Farrukhabad; and Kasganj.

In the State of Jammu & Kashmir, Basmati rice is grown in the following districts: Jammu; Kathua and Samba.

The geographical coordinates of the Basmati rice growing region are:

| Extremes | District | State | Geographic Coordinates |
|---|---|---|---|
| East | Pithoragarh | Uttrakhand | 81o 02’ 09.3” E Longitude |
| West | Firozepur | Punjab | 73o 52’ 33.9” E Longitude |
| North | Chamba | Himachal Pradesh | 33o 16’ 14.7” N Latitude |
| South | Auraiya | Uttar Pradesh | 26o 22’ 13.5” N Latitude |

## Link between the geographical area and the special qualities of BASMATI

There are historical, traditional, cultural and social links between Basmati rice as a product and the geographical area. These links include the unique qualities of the product and its reputation. Rice produced in the geographic area has the special aromatic and physical characteristics and has acquired a substantial domestic and international reputation as Basmati. Any member of the trade or public in India or abroad ordering Basmati rice or seeing rice advertised or offered for sale as Basmati rice will expect the rice so ordered, advertised or offered for sale to be the rice cultivated, grown and produced in the aforesaid region of the IGP and having the aforesaid special characteristics. Basmati rice has gained a reputation for its unique characteristics that has spread, over the centuries, beyond India to all parts of the world where rice is consumed.

## The quality, reputation or other characteristics of the product

*Historical origin and reputation*

Indian farmers are known to have been growing scented rice varieties for several centuries. Scented rice varieties in ancient literature were known by various names. In fact, the name Basmati is so old that the origin of assigning the name to this famed rice is lost in antiquity. The first recorded reference to Basmati rice can be found in the epic Punjabi poem Heer Ranjha by the great Punjabi Poet Varis Shah dated 1766.

Historically, Basmati rice has been associated in the public mind as a special long grain aromatic rice grown and produced in a particular geographical region situated below the foothills of the Himalayas. This public perception and recognition are evident from the general body of information such as the following:

(i) References to Basmati rice can be found in gazetteers published during the time of British rule in India. Some of such gazetteers referring to the cultivation and special quality of Basmati rice are part of Annexure 7 to the Technical Specification.

(ii) Besides, Basmati rice traders nationally and internationally have been consistently describing Basmati rice marketed by them to mean a special rice variety originating from a region below the foothills of the Himalayas and possessing the said qualities. Certain specimen packaging of Basmati rice sold in India and abroad by traders as well as extracts taken from the websites of prominent traders and exporters of Basmati rice, all describing the sub-Himalayan origin of Basmati rice are part of Annexure 8 to the Technical Specification.

(iii) Among the food and restaurant industry, Basmati rice occupies a special place as a variety of premium rice both in India and internationally among the food and restaurant industry. Extensive literature extracts, including references from well-known dictionaries and food encyclopaedias, clearly describe the geographical origin and significance of the name Basmati in relation to this famous rice.

Owing to its special flavour, aroma and cooking properties that are best suited for Asian dishes such as *biryani* and *pulao,* Basmati rice has become very popular in numerous foreign countries. In fact, the demand for Basmati rice has been increasing over the last few decades. Basmati rice has been and continues to be exported to major countries all over the world including Saudi Arabia, Kuwait, United Arab Emirates, the United Kingdom, the United States of America, Canada and Europe.

*Environmental factors*

The specific characteristics of Basmati rice are essentially attributable to the agro-climatic conditions prevailing in the traditional Basmati rice growing area. It is the interplay of agro-climatic conditions such as

temperature, humidity, day length, solar radiation, sufficient water supply and normal soil that significantly influences the Basmati crop physiology.

Even minor variations in temperature in the said region makes a difference to the growth parameters of the Basmati rice plant. Such variations are said to have dramatic effects on the grain filling and grain setting in Basmati rice. These conditions are available only in the aforesaid geographical region of the IGP with a relatively cooler climate with day temperature ranging between 25 to 32 degrees Celsius and night temperature ranging between 20 to 22 degrees Celsius during grain filling for maximum retention of aroma in the grains. Consequently, only one crop of Basmati can be grown in a year during the Kharif season.

***Key Features of Climatic Conditions are:***

- Temperature, humidity, day length, solar radiation, irrigation, normal soil.

- Environmental factors of a product of the IGP. There is a consensus amongst the scientific community that the uniqueness of Basmati rice can be attributed to the agro-climatic conditions prevailing in the traditional Basmati growing area.

- The interplay of agro-climatic conditions including temperature, humidity, day length, solar radiation, sufficient water supply and normal soil that significantly influence the physiology of the Basmati crop. Also, reference is made to the significance of temperatures at a particular range in order to ensure maximum retention of the aroma in the grains.

- Timing and spacing of the seeds are of importance as well as ensuring there is carbon-enriched soil and the maintenance of standing water and irrigation techniques.

- The method of harvesting the crop and the timings as well as moisture content.

Numerous publications presented in Annexures 5-7 to the Technical Specification discuss the climatic requirements for cultivating Basmati rice including prolonged sunshine, high humidity and assured water supply resulting in kernel elongation and non-stickiness of cooked rice. The publication given in Annexure 9 discusses the optimum climatic requirements including a temperature between 20-35 degrees Celsius throughout crop duration, low night temperatures and reduced maintenance respiration. It also discusses heavy neutral soils and the optimum PH required for growth and productivity. The publication

specifically refers to the regions in northern India to be the prime locations for cultivation.

To sum up, the following environmental conditions can be highlighted, as presented below.

High Humidity: During the grain filling period, which is the most crucial for the best expression of Basmati quality traits, average relative humidity in the Basmati rice growing region ranges from 60-65%. However, humidity is not a standalone factor to decide quality parameters. The interplay of environment, water and edaphic factors are important in deciding quality traits of Basmati rice.

Solar radiation and Day Length: In the Basmati rice growing regions, the day length at a given period in a calendar month are longer than that in central or southern India. Further, since rice is a “short day” plant, the process of maturity of paddy is further delayed in areas where there are longer days. In areas that experience longer light hours, the maturation of the grain is further delayed. Effectively, as explained, on the same given date of a month, the physiological stage of a variety of Basmati rice at a place that has longer days will be behind the physiological stage of the same variety at a place that has shorter days. It is the interplay of such photoperiod exposing the developing grains to optimal solar radiation, with other factors such as temperature and humidity in the said region that enable Basmati rice to accumulate and retain its aromatic compounds and other characteristics.

Sufficient water supply: By and large, irrigation water is canal water coming from rains/ snow-melted water of the Himalayas.

Normal soil: Soils of Basmati rice growing region are developed from Indo-Gangetic alluvium. These are slightly alkaline in reaction (pH 7.3 - 8.5), deep (>1m), well-drained and generally sandy loam to loam in texture. These soils are generally low (<0.5%) to medium (0.5 - 0.75%) in organic carbon content. The clay fraction of soil is dominated with illite - a potassium (K)-rich mineral. Hence, these soils are well-supplied with K as revealed by medium (120-280 Kg K/ha) to high (>280 Kg K/ha) K fertility status.

Temperature: In the IGP, the temperature during grain-filling period remains mild (day: 25-32 degrees Celsius/ night: 20-22 degree Celsius) allowing strong aroma in the grains. The principal chemical constituent of aroma in Basmati rice is 2-acetyle-1-pyrroline, which is volatile in nature. The maximum retention of aroma in grains happens when grain-filling coincides with mild temperature.

## Specific steps in production that must take place in the identified geographical area

The productivity and quality of Basmati rice is greatly influenced by the timing of the transplanting. In normal conditions, if the traditional tall varieties of Basmati rice are transplanted before 30th of June, they attain excessive growth and are prone to 'lodging' at the flowering or grain filling stage. Also, early transplantation of seedlings impairs cooking quality as grains become extremely opaque or exhibit abdominal whiteness due to improper development under high temperature caused by the loose packing of starch molecules. The optimum time for transplanting the seedlings is during the first half of July.

Seedlings are normally planted in rows with 1-2 seedlings per hill. For regular transplanted crops, row to row and plant to plant at 20x15 cm is generally maintained and in case of late transplanted crops, the spacing is usually 15x15 cm. Seedlings should be planted shallow (2 to 3 cm deep) as deep planting takes more time for establishment and gives less 'tillering'.

Standing water is maintained in paddy fields up to 2-3 weeks after planting, which helps in the establishment of good plants and controls weeds. After the absorption of the standing water, fields are irrigated as necessary.

Basmati rice is grown in carbon enriched soils generally maintained through the application of farm yard manure of 8-10 tons/ ha or green manuring with legumes.

Harvesting of the Basmati crop takes place as soon as 90% of the grain matures so as to avoid loss by shattering, lodging and physical damage to the grains. The harvested crop is generally threshed the same day or as soon as possible thereafter and dried to a moisture content of 12-14% to prevent the development of grain moulds or any other fungal attack or insect damage during storage.

## Specific rules concerning slicing, grading, packaging, etc. of BASMATI rice

The Basmati Rice (Export) Grading and Marking Rules 1979, notified by the Government of India under the Agricultural Produce (Grading and Marking) Act, 1937 (AGMARK), set out grade designation and packaging requirements for Basmati rice.

## Packaging requirements

Under the Basmati Rice (Export) Grading and Marking Rules, 1979, the rice may be packed only in sound, clean and dry containers made of jute or any other material as approved by the Agricultural Marketing adviser. The

containers must also be free of any insect infestation or fungus contamination and any undesirable smell. The containers must also be securely closed and sealed in a manner approved by the Adviser.

Authorized packers are also required to make such arrangements for testing Basmati rice as may be prescribed by the Agricultural Marketing Adviser. An authorized packer shall provide all facilities as may be necessary for sampling, testing, etc., to the inspecting officers duly authorized by the Adviser.

In accordance with the Codex Standard 198-1995 (International Standard: Rice), applicable in India, rice must be packaged in containers that will safeguard the hygienic, nutritional, technological and organoleptic qualities of the food. The containers must be made of substances that are safe and suitable and are free of toxic substances or undesirable odours or flavours. Sacks must be sealed, sewn, clean and sturdy.

## Labelling requirements

The Basmati Rice (Export) Grading and Marking Rules, 1979 also set out the following particulars for labelling:

(a) The Serial Number of the lot;

(b) Date of packaging;

(c) Name of the packer;

(d) Place of packing; and

(e) The manner of use of an authorised packer's private trademark

In addition, the Rules specify that the packaging must specify the quality by way of a grade designation mark. The mark should consist of a label bearing a design consisting of an outline map of India with the word 'AGMARK' and the figure of the rising sun with the words 'Produce of India' which are set out in Schedule 1 to the 1979 Rules.

The mark should be securely affixed to each container in a manner approved by the Agricultural Marketing Adviser and the container should also be clearly marked with such particulars and in such a way, so they can be specified by the Agricultural Marketing Adviser.

An authorized packer may, after obtaining permission from the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the officer, provided the trademark does not represent a quality or grade of Basmati rice different to that indicated by the mark affixed to the container in accordance with the Rules.

In addition, the name of the product must be shown on the label in accordance with the definitions provided by the 1-1985 Standard. When labelling non-retail containers, information shall be given either on the container or accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packers shall appear on the container. However, an identification mark if clearly identifiable with the accompanying documents can replace this requirement.

## Controls on compliance with the Specifications

The government of India has designated the Basmati Export Development Foundation (BEDF) as the public authority responsible for the verification of compliance with the specification within the terms of Article 37(2) of Regulation 1151/2012.

Controls ensuring the authenticity and purity of Basmati rice are carried by the BEDF located in Modipuram, Uttar Pradesh. The BEDF is registered under the Societies Registration Act, 1860. Among the aims and objectives of BEDF is to monitor and bring in traceability for authenticity in production, processing, quality, supply and other related aspects and characteristics of Basmati Rice designated as Geographical Indication (GI) both in domestic and international markets, including but not limited to engaging necessary agencies and undertaking all other acts, matters or things as may be deemed necessary or incidental thereto.

BEDF has established a Basmati Research Farm and a Laboratory-cum-Office complex set up to undertake testing and research of Basmati rice. It is a unique integrated facility for complete testing of Basmati rice under one roof, for exports as well as for the domestic market. Further, BEDF has also been designated as an authorised centre for testing of samples of Basmati rice for variety identification. Accordingly, Customs officials draw samples for variety identification and send these samples for analysis to BEDF.

BEDF has been working with Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad under the Department of Biotechnology, Government of India, which has developed a protocol for DNA Fingerprinting for varietal identification of Basmati rice.

All Basmati Exporters are required to be registered with APEDA. This listing is made available to public authorities designated by India to verify compliance with the Specification.

## Proof of Origin

Rules for the import of Basmati into the EU have been set out by the European Union (EU) in Commission Regulation (EC) No. 972/2006 of 29 June 2006. These Rules are in respect of duty derogation by EU for import of husked Basmati rice from India. In compliance with this Regulation, the Export Inspection Council of India issues authenticity certificate in respect of each consignment of Basmati rice for export to EU under this arrangement. This body has been designated by India as one of the public authorities responsible for the verification of compliance with the specification and in particular with ensuring that Basmati originates in the geographical area.

Notification No 29/2015-2020 of the Ministry of Commerce and Industry dated 4 November 2019 amends the Policy Condition of SI. No. 55 and 57 Chapter 10 Schedule-2 ITS (HS) Export Policy, 2018 – reg. to the effect that the export of BASMATI rice to the EU member states is permitted subject to the issuance of a Certificate of Inspection by the Export Inspection Council (EIC)/Export Inspection Agency (EIA). This certificate of inspection ensures the origin of BASMATI rice. There are separate provisions for the origin of non-BASMATI rice.