“Joha rice of Assam”


Facilitated by
Assam Agricultural University,
Jorhat, Assam -785013
Registration details:

Name of the Applicant : 1. Assam Agricultural University
2. Seuj Satirtha

Address : 1. Assam Agricultural University
          Jorhat, Assam – 785013, India
2. Seuj Satirtha
       Central Cultural Building, Kachumari,
       Dehajan, Demow-785662, Dist. Sivasagar,
       Assam, India

Types of Goods : Class 30 – Rice

Specification:

‘Joha’ is a special class of Sali rice (Winter rice) of Assam in cultivation over centuries
and characterized by aromatic endosperm. A large number of traditional Joha varieties
have been cultivated by the farmers since time immemorial. Joha varieties are mostly
short or medium grained and have very low yield potential. However, this class of
aromatic rice differs from Basmati rice in growth habit, areas of adaptation, Physico-
chemical properties of grains and grain shape and cooked grain elongation pattern. The
major grain characteristics of Joha rice genotypes are given below:

1. Grain length: 5.2 – 10.0mm
2. Grain breadth: 1.9-3.0mm
3. Ratio between grain length and grain breadth: 2.3 – 4.5 (short bold to
   Medium slender)
4. Decorticated grain colour: Black, White
5. 1000 grain Weight: 7-26 g
6. Cooked kernel elongation ration: 1.0- 1.4
7. Total milled rice 65-75%
8. Head rice recovery (%) 60-65%
9. Gelatinization temperature: Intermediate
10. Chalkiness 10-20%
11. Amylose content 20 – 24%
12. Total soluble sugar 0.412 – 0.773%
13. Reducing sugar 0.121 – 0.264%
14. Gel consistency Soft
15. Concentration of 2 – acetyl-1-pyrroline 0.4 – 4.85 ppm
16. Aroma Intensity Strong
17. Amylose content 19-24%
**Plant characteristics:**
The plants are tall, have long maturity duration and are photoperiod-sensitive. Joha rice has an average grain yield of less than one ton per hectare. The plant characters are given below.

1. **Plant Height:** 121 – 174 cm
2. **Number of grain bearing effective tiller per plant:** 8 – 13
3. **Days from sowing to maturity:** 135 – 165 days
4. **Panicle length:** 24 – 33 cm
5. **Flag leaf length:** 27 – 41 cm
6. **Flag leaf width:** 0.8 – 1.3
7. **Flag leaf area:** 30 – 44 cm²
8. **Number of grain per panicle:** 108 – 303
9. **Spikelet sterility percentage:** 18 – 30%
### Biochemical composition for the major nutritional parameters and calorific values for the fourteen indigenous cultivars of scented rice (Joha)

<table>
<thead>
<tr>
<th>Name of the cultivar</th>
<th>Crude protein (%)</th>
<th>Total carbohydrate (%)</th>
<th>Lipid (%)</th>
<th>Crude fibre (%)</th>
<th>Total Ash (%)</th>
<th>Calorific value kcal/100gm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boga</td>
<td>8.09</td>
<td>65.75</td>
<td>2.43</td>
<td>0.66</td>
<td>1.66</td>
<td>317.23</td>
</tr>
<tr>
<td>Keteki</td>
<td>7.34</td>
<td>70.12</td>
<td>2.66</td>
<td>0.75</td>
<td>1.33</td>
<td>375.06</td>
</tr>
<tr>
<td>Kharika</td>
<td>7.69</td>
<td>68.43</td>
<td>2.33</td>
<td>0.75</td>
<td>1.66</td>
<td>325.45</td>
</tr>
<tr>
<td>Khutki</td>
<td>7.03</td>
<td>67.51</td>
<td>2.33</td>
<td>0.55</td>
<td>1.49</td>
<td>319.13</td>
</tr>
<tr>
<td>Gabharu</td>
<td>8.43</td>
<td>66.75</td>
<td>2.03</td>
<td>0.33</td>
<td>1.33</td>
<td>319.01</td>
</tr>
<tr>
<td>Naga</td>
<td>7.39</td>
<td>70.50</td>
<td>3.73</td>
<td>0.75</td>
<td>1.33</td>
<td>345.13</td>
</tr>
<tr>
<td>Biri</td>
<td>6.12</td>
<td>70.74</td>
<td>2.13</td>
<td>0.43</td>
<td>1.00</td>
<td>326.61</td>
</tr>
<tr>
<td>Kola</td>
<td>8.35</td>
<td>72.62</td>
<td>2.06</td>
<td>0.75</td>
<td>1.33</td>
<td>342.42</td>
</tr>
<tr>
<td>Gobinda</td>
<td>7.09</td>
<td>75.08</td>
<td>2.80</td>
<td>0.50</td>
<td>1.33</td>
<td>353.88</td>
</tr>
<tr>
<td>Tulsi</td>
<td>8.38</td>
<td>80.88</td>
<td>2.66</td>
<td>0.50</td>
<td>1.00</td>
<td>380.98</td>
</tr>
<tr>
<td>Hung</td>
<td>7.63</td>
<td>72.31</td>
<td>2.16</td>
<td>0.75</td>
<td>1.33</td>
<td>339.20</td>
</tr>
<tr>
<td>Babuli</td>
<td>8.26</td>
<td>80.59</td>
<td>2.88</td>
<td>0.66</td>
<td>1.00</td>
<td>381.36</td>
</tr>
<tr>
<td>Kunkuni I</td>
<td>7.43</td>
<td>65.85</td>
<td>2.46</td>
<td>0.25</td>
<td>1.33</td>
<td>315.31</td>
</tr>
<tr>
<td>Kunkuni II</td>
<td>7.06</td>
<td>66.56</td>
<td>2.33</td>
<td>0.33</td>
<td>1.33</td>
<td>315.45</td>
</tr>
<tr>
<td>CD (P=0.05)</td>
<td>0.432</td>
<td>1.877</td>
<td>0.183</td>
<td>0.141</td>
<td>0.062</td>
<td>2.50</td>
</tr>
<tr>
<td>CD at 1%</td>
<td>0.583</td>
<td>2.530</td>
<td>0.247</td>
<td>0.187</td>
<td>0.083</td>
<td>3.36</td>
</tr>
</tbody>
</table>


**Logo:**

![JOHA RICE OF ASSAM](image-url)
Description of the Goods:

Joha rice is an indigenous rice of Assam. The famous Assam Rice Collection with more than 6000 rice accessions maintained at international Rice Research Institute, Manila and subsequently shared with Central Rice Research Institute, Cuttack includes Joha landraces of Assam. Regional agricultural Research Station (RARS) of Assam Agricultural University at Titabar has also developed improved Joha variety, “Keteki Joha” using traditional Joha landrace of Assam and other high yielding variety. The aroma of Joha rice is also considered to be higher than Basmati in terms of 2-acetyl – 1- pyrroline level (a major indicator of aroma level). In 2007, the first consignment of 17 MT of Joha rice was exported to three European countries viz., Germany, U.K. and switzerland where it was of high demand. This demand is due to uniqueness in aroma and grain type which has established Joha as brand equity.

Geographical area of Production:

Assam is one 2nd of the eight states of Northeast India, which is located between 24º N and 28º18’ N latitudes and 89º.4’ E and 96º 0’ E longitudes. The State is surrounded by Arunachal Pradesh, Nagaland, Manipur and Myanmar in the east; Mizoram, Tripura and Meghalaya in the south; Bangladesh and west Bengal in the west and Bhutan and Arunachal Pradesh in the north. The state is surrounded by many hills in all directions. The total geographic area of Assam is 78523 sq. km with a population of 31 million as per 2011 census. The climate of Assam is of humid subtropical nature with warm humid summer and cool dry winter, Due to unique geographical location coupled with varied physiography, the state has wide array of climatic conditions. Soils in the Assam valley are acidic and high in available phosphorus and potassium and moderate in organic matter and nitrogen. The most typical characteristic of Assam soil is acidity, where pH of the soils generally ranges between 4.2 to 5.8. The annual normal rainfall is 2431.9 mm of which 1550.0 mm occurs during the months from June to September. Most of the Joha rice cultivation is under the mercy of monsoon rains during Sali season (June/July – November/December). The mean annual maximum temperature varies from
23.6° C to 31.7° C and minimum temperature varies from 10° to 25.2° C.

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

Information about the Joha rice landrace like ‘Khorika Joha’ is noted in the 14th century old Assamese version of the Ramayana (*Saptakanda Ramayana*) attributed to the poet Kaviraja Madhava Kandali. It is considered to be the first translation from the Sanskrit to a modern Indian language. This work is also considered as one of the earliest written scripture in Assamese language. According to the story, Kumbhakarna, was a rakshasa and younger brother of Ravana, the king of Lanka. When Ravana needed the help of his brother Kumbhakarna, the latter was in deep slumber as usual. He had to be awakened with great difficulty, Among many tricks mentioned in this scripture to wake him up, Ravana prepared a heap of delicious food made from Kharika Joha, a popular landrace of Joha.

The Joha rice varieties are genetically distinct from other classes of rice cultivated in Assam and elsewhere. A study on diversity analysis at DNA level based on molecular markers clearly showed that Joha rice varieties were distinct from other rice varieties, as reflected in separate grouping form other varieties of Assam rice.

**Method of Production:**

The Joha rice, with pleasant aroma and fine grain characteristics fetches premium price over the best non-aromatic quality grained rice varieties in the domestic market. It is the most preferred class of rice for eating and farmers of the state invariably grow this class of rice at least for their home consumption at special occasions. However, the varieties of Joha rice are rarely grown by the farmers for commercial purpose mainly due to low productivity. Out of 17 lakh ha of Sali rice area in the state, almost 5% area is under Joha cultivars. The productivity of these photoperiod sensitive, tall traditional Joha cultivars is not more than 1.0 tonne per hectare. Moreover, Joha rice is grown in relatively marginal lands. The Regional Agricultural Research Station, Titabar, Assam has been making efforts for germplasm collection of Joha rice. About 42 Joha rice cultivars were collected from different parts of the state and are conserved in the station.
Assam is one of the eight states of Northeast India, which is located between 24° N and 28°18’ N latitudes and 89°.4’ E and 96°0’ E longitudes. The State is surrounded by Arunachal Pradesh, Nagaland, Manipur and Myanmar in the east; Mizoram, Tripura and Meghalaya in the south; Bangladesh and west Bengal in the west and Bhutan and Arunachal Pradesh in the north. The state is surrounded by many hills in all directions. The total geographic area of Assam is 78523 sq. km with a population of 31 million as per 2011 census. The climate of Assam is of humid subtropical nature with warm humid summer and cool dry winter, Due to unique geographical location coupled with varied physiography, the state has wide array of climatic conditions. Soils in the Assam valley are acidic and high in available phosphorus and potassium and moderate in organic matter and nitrogen. The most typical characteristic of Assam soil is acidity, where pH of the soils generally ranges between 4.2 to 5.8. The annual normal rainfall is 2431.9 mm of which 1550.0 mm occurs during the months from June to September. Most of the Joha rice cultivation is under the mercy of monsoon rains during Sali season (June/ July – November/ December). The mean annual maximum temperature varies from 23.6° C to 31.7° C and minimum temperature varies from 10° to 25.2° C.

Joha rice is grown in marginal lands, uplands or on Sali seed beds after uprooting the seedlings, late in the season. Harvesting of crop will be done after attainment of physiological maturity after cultivating as a transplanted crop.

**Raising of Seedlings:**

Land is thoroughly puddled and seed beds of 10 m length and 1.25 m width are prepared with 30 cm gap in between the beds. The length of the bed may vary according to convenience. Seed beds are mainly fertilized with dry cow dung, not wet cow dung as followed in seed bed of other rice. The nursery is raised by wet method. Germinated seeds are used for sowing in the well prepared nursery bed and adequately watered. The nursery bed is drained occasionally to encourage production of vigorous seedlings with short roots. Seedlings will be ready for transplanting 25-30 days after sowing.
Main Field Preparation:

Field is prepared thoroughly by ploughing 4 to 5 times followed by harrowing and laddering. Traditionally ploughing starts more than a month ahead of transplanting so that weeds are dried up / decayed. Well rotten FYM or compost at the rate of 10t/ha is applied during field preparation. In addition, the inorganic fertilizers are also suggested at rate of 20 kg nitrogen, 10 kg phosphate and 10 kg potash per hectare in areas with moderate fertility level. Since Joha rice cultivars are less responsive to chemical fertilizer and many farmers do not have access to chemical fertilizers. Consequently very little if any chemical fertilizer is applied in Joha rice.

Seedlings are transplanted @ 2-3 Seedlings per hill in rows at a spacing of 30-35 cm between rows and 20-25 cm between plants within rows at a depth of 3-4 cm in medium lands. Farmers hardly apply any chemicals for pest control, since traditional varieties of Joha rice have moderate level tolerance to major pests. The crop attains maturity at 135-165 days. The temperature between 28°C and 30°C during flowering and dough stage are ideal for the expression of aroma in rice.
Harvesting:
Harvesting of crop will be done after attaining physiological maturity. This usually coincides with November-December months. Upon attaining physiological maturity, panicles are selected using strict quality standards using characteristic morphological features of the Joha rice for the collection of seeds for the next season. Threshing of the harvested panicles is done manually by feet in a clean and dry place. After threshing manually, seeds are cleaned and dried in sunlight to a moisture level of 12 to 13 percent. Seeds are stored in “Toom” after proper drying and cleaning. Toom is a container made of bamboo bands with paddy straw lining. Straw used in Toom should be of the same variety used for storage. Parboiling of paddy reduces the aroma and quality and hence it is not adopted for Joha rice.

Uniqueness

The Joha class of rice is unique in aroma and grain characteristics and distinct from other aromatic rice like Basmati in biochemical and other quality attributes. The uniqueness of Joha rice is mainly attributed to particular climatic conditions prevalent in the area, together with varietal characters and system of rice cultivation, adding to the best expression of aroma and flavor in the product. The aroma of Joha rice is also considered to be distinctly different from Basmati rice. Some Joha rice varieties also possess higher level of 2-acetyl-l-pyrroline level than Basmati rice.

In Assam, the two main rivers viz., the Brahmaputra and the Barak flow through the state with 40 and 7 major tributaries each, respectively. The Brahmaputra valley occupies about 5.6 million ha with 24 administrative districts while the Barak valley is about 0.7 million ha with 3 districts. The Brahmaputra flows from the east (Sadiya) to west (Dhubri). The altitude at Sadiya is 134 m while in Dhubri it is 35 m. The Brahmaputra valley is an alluvial plains having variable topography. The Barak river flows from east to west through undulating plains. Thus the state has three distinct physiographic units – the plains of the Brahmaputra and the Barak valleys and the plateaus. On an average, the relative humidity is more than 80% in almost all the locations of Assam throughout the
year. Even during dry winter months, the average relative humidity is never below 75% in the region. Because of such unique agro-ecological features, Joha rice is successfully cultivated in this region.

**Inspection Body**

An Internal watchdog body to look after the quality and regulating the use of Geographical Indication will comprise of:

(i) The Director of Agriculture, Assam- Chairman
(ii) The Director of Research (Agri), Assam Agricultural University, Jorhat - Member Secretary
(iii) The Director of Extension Education, Assam Agricultural University, Jorhat – Member
(iv) The Chief Scientist, Regional Agricultural Research Station, Titabar – Member
(v) The Chairman, Farm Management Committee, Assam – Member

The Inspection Body shall consist of the following members.

(i) Chief Scientist, Regional Agricultural Research Station, Titabar – Chairman
(ii) Chief Scientist, Regional Agricultural Research Station, North Lakhimpur – Member
(iii) Chief Scientist, Regional Agricultural Research Station, Shillongani – Member
(iv) Chief Scientist, Regional Agricultural Research Station, Gossaigaon – Member
(v) Chief Scientist, Regional Agricultural Research Station, Karimganj – Member
(vi) Chief Scientist, Regional Agricultural Research Station, Diphu – Member

The Regional In-charge of Agricultural & Processed Food Products Export Development Authority (APEDA), Guwahati shall be the independent neutral
agency in the inspection body to monitor quality of the GI product after registration.

Others

Joha rice is an indigenous rice class of Assam. The famous Assam Rice Collection having more than 6000 rice accessions maintained at international Rice Research Institute, Manila and subsequently shared with Central Rice Research Institute, Cuttack includes Joha landraces of Assam. Regional agricultural Research Station (RARS) of Assam Agricultural University at Titabar has also developed improved Joha variety, “Keteki Joha” involving Joha landrace of Assam and high yielding variety. The aroma of Joha rice is also considered to be higher than Basmati in terms of 2-acetyl – 1- pyrroline level (a major indicator of aroma level). In 2007, the first consignment of 17 MT of Joha rice was exported to three European countries viz., Germany, U.K. and Switzerland where it was of high demand. This demand is due to uniqueness in aroma and grain type which has established Hoha as brand equity. However, there is a legitimate concern among farming community, academician and policy makers that market potential of Joha rice may be jeopardized by some unscrupulous trader/middle men to sell other small grain aromatic rice developed elsewhere in the name of Joha rice. This exploitation might deprive the genuine farmers from their entitlement as well as consumers of Joha rice being deceived by believing that they are buying the genuine Joha rice. In other word, unauthorized parties may mislead the public as the true origin of Joha rice which is unique class of rice originating in Assam with given quality, reputation and characteristics attributable to its cultivation in specific agro-ecological situation, with a labour intensive, eco-friendly and organic manner which has traditional and historic significance. Therefore, Seuj Satirtha intends to protect and promote uniqueness of Joha rice for its intellectual property to enable identification through GI registration as a particular class of rice solely originating from the state of Assam and to enable the consumers in identifying genuine Joha rice with a given quality, attributes and reputation due to the geographical location in the state of Assam.

Photo courtesy: Regional Agricultural Research Station, Titabor, Jorhat, Assam