

## MAKARAM AND KUMBHAM - TWO IMPROVED RICE VARIETIES FOR THE CHERADY TRACTS OF KERALA

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**Abstract:** Two long duration high yielding photosensitive varieties of rice viz. Makaram and Kumbham have been developed and recommended for commercial cultivation in the second crop season in the deep ill-drained soils of the southern districts of Kerala. These varieties were developed through mass selection and bulk progeny testing of the local Cherady type, so as to retain its broad genetic basis. Makaram has a yield potential of 5.2 t grain and 11.1 t straw per ha, whereas Kumbham has a yield potential of 4.7 t grain and 10.8 t straw per ha. Both these varieties are comparatively tolerant to acidic soils, pests and diseases and Kumbham is comparatively tolerant to lodging.

**Key words:** Bulk progeny testing, Cherady, Kumbham, Makaram, photosensitive, rice varieties

### INTRODUCTION

In Kerala, photosensitive varieties are preferred in the eastern lateritic tracts during Mundakan season since planting can be adjusted along with the onset of rainfall and can be harvested during the dry condition of paddy field. The Cherady tract of this region extends between Parassala and Ranni. This field is usually ill-drained and marshy from May to December. Strictly photosensitive and acid tolerant varieties are preferred in this region. Though a number of high yielding varieties are available (KAU, 1996), farmers are still cultivating the local Cherady type due to its adaptability, resistance to pests and diseases and fairly high straw yield. The farmers of this tract were demanding the genetic purification and upliftment of local Cherady for high yield. Therefore, a research programme was started to evolve superior high yielding varieties suitable to these areas retaining the quality and broad genetic base of local Cherady type by mass selection and bulk progeny testing.

### MATERIALS AND METHODS

A research project on the "Genetic improvement of the popular rice variety Cherady for the mundakan season of lateritic areas" was taken up at the Rice Research Station (presently as Onattukara Regional Agricultural Research Station), Kayamkulam and Farming Systems Research Station / Krishi Vigyan Kendra, Kottarakkara during 1992-93. An exhaustive survey was conducted all over the Cherady tracts of Kerala and a total of 815 collections were made. From these 815 collections, 144 types were selected out based on panicle characters and were tested in initial evaluation trials (IETs) with checks during 1993-94 and 1994-95 at the State Seed Farm,

Kottarakkara. The results of IET I & II clearly indicated the wide range of values for majority of characters and the immense scope of developing elite types.

Based on the results of two IETs, 16 elite cultures were developed by bulking a number of similar elite types. These 16 selected cultures were advanced to comparative yield trials (CYTs) with five standards (Cherady, Ptb-20, Lakshmy, Dhanya and Nila) during 1995-96, 1996-97 and 1997-98 mundakan season at the State Seed Farm, Kottarakkara.

### RESULTS AND DISCUSSION

The CYTs indicated superiority of four pre-released cultures viz. 1, 3, 5 and 16 to check varieties (Table 1). The results of CYTs clearly indicated the superiority of the Cultures 5, 3, 1 and 16 over all the five checks. Based on the results of CYTs conducted, 22 farm trials in Kollam and Pathanamthitta districts during 1997-98 mundakan season. The results of farm trials are presented in Table 2.

The results of farm trials clearly indicated the superiority of Culture 5. This recorded grain yield of 5209 kg ha<sup>-1</sup> and straw yield of 11.1 t ha<sup>-1</sup>. This is followed by Culture 3, which recorded a grain yield of 4738 kg ha<sup>-1</sup> and straw yield of 10.83 t ha<sup>-1</sup>. The standard check recorded grain and straw yield of 3.403 and 8.4 t ha<sup>-1</sup>, respectively.

Based on the farm trial data, the Cultures 5 and 3 were proposed for release and the 19th meeting of the State Seed Subcommittee held at Thiruvananthapuram on 16th May 1998 approved the release of the two cultures as KTR-2 (Makaram)

Table 1. Yield potential of Cherady cultures in CYTs conducted at State Seed Farm, Kottarakkara during mundakan seasons

| Sl No     | Culture/ Check | Grain, kg ha <sup>-1</sup> |             |             |             | Straw kg ha <sup>-1</sup> |             |             |             |
|-----------|----------------|----------------------------|-------------|-------------|-------------|---------------------------|-------------|-------------|-------------|
|           |                | 95-96 CYT-1                | 96-97 CYT-2 | 97-98 CYT-3 | Pooled mean | 95-96 CYT-1               | 96-97 CYT-2 | 97-98 CYT-3 | Pooled mean |
| 1         | Cul-1          | 2605                       | 3612        | 3449        | 3222        | 6902                      | 6877        | 7435        | 7071        |
| 2         | Cul-3          | 3682                       | 3366        | 3657        | 3568        | 9489                      | 8544        | 8160        | 8731        |
| 3         | Cul-5          | 3824                       | 3824        | 4803        | 4150        | 10035                     | 8128        | 10595       | 9586        |
| 4         | Cul-16         | 2952                       | 4033        | 3656        | 3547        | 7124                      | 7398        | 7040        | 7187        |
| 5         | Cherady        | 1806                       | 3439        | 2960        | 2735        | 6165                      | 6877        | 7238        | 6760        |
| 6         | Ptb-20         | 2213                       | 2292        | 1512        | 2005        | 3675                      | 4689        | 3618        | 3994        |
| 7         | Lakshmy        | 2320                       | 2574        | 1258        | 2051        | 3932                      | 4897        | 2632        | 3821        |
| 8         | Dhanya         | 1806                       | 2397        | 2301        | 2168        | 4262                      | 5002        | 5132        | 4798        |
| 6         | Nila           | 2449                       | 3053        | 3075        | 2859        | 7752                      | 6773        | 6285        | 6936        |
| CD (0.05) |                | 575                        | 392         | 172         | 693         | 2020                      | 1677        | 585         | 1404        |

Table 2. Mean yield of pre-released cultures during mundakan 1997-98

| Culture / standard | Grain yield         |                       | Straw yield        |                       |
|--------------------|---------------------|-----------------------|--------------------|-----------------------|
|                    | kg ha <sup>-1</sup> | % increase over local | t ha <sup>-1</sup> | % increase over local |
| Cul-1              | 4280                | 25                    | 09.8               | 13                    |
| Cul-3              | 4738                | 39                    | 10.2               | 21                    |
| Cul-5              | 5209                | 53                    | 11.1               | 32                    |
| Cul-16             | 4266                | 25                    | 09.2               | 09                    |
| Lakshmy            | 3048                |                       | 06.1               |                       |
| Local              | 3403                |                       | 08.4               |                       |
| CD (0.05)          | 329                 |                       |                    |                       |

Table 3. Reaction to major pests, diseases and lodging of Cherady cultures, (1-9 scales)

|                        | Cul-1         | Cul-3 (Kumbham) | Cul-5 (Makarom) | Cul-16 |
|------------------------|---------------|-----------------|-----------------|--------|
| A. Pests               |               |                 |                 |        |
| Leaf folder            | 2.25          | 2.50            | 1.50            | 2.0    |
| Stem borer             | 1.90          | 2.50            | 1.10            | 1.10   |
| Gall fly               | No occurrence |                 |                 |        |
| BPH                    | No occurrence |                 |                 |        |
| B. Diseases            |               |                 |                 |        |
| Blast                  | No occurrence |                 |                 |        |
| Sheath blight          | 2.75          | 1.50            | 2.50            | 2.00   |
| C. Lodging at maturity | 7.00          | 1.50            | 4.00            | 5.00   |

and KTR-3 (Kumbham) respectively for eastern lateritic areas during mundakan season (Anon., 1998). Since these varieties were evolved from the local variety, these are comparatively toler-

ant to soil acidity and majority of pests and diseases. The pest and disease score are presented in Table 3. Among pests, stem borer and among diseases, sheath blight are the common occurring

Table 4. Quality analysis

| Sl. No | Characters                  | Culture 5 | Culture 3 | Cherady |
|--------|-----------------------------|-----------|-----------|---------|
| 1      | Hulling %                   | 79        | 79        | 79      |
| 2      | Milling %                   | 74        | 73.7      | 74      |
| 3      | Head rice %                 | 40        | 45        | 43      |
| 4      | Length (mm)                 | 5.60      | 5.77      | 5.80    |
| 5      | Breadth (mm)                | 2.67      | 2.75      | 2.76    |
| 6      | L/B (mm)                    | 2.10      | 2.10      | 2.10    |
| 7      | Classification              | SB        | SB        | SB      |
| 8      | Kernel colour               | Red       | Red       | Red     |
| 9      | Abdominal white             | Present   | Present   | Present |
| 10     | Alkali value                | 3.0,2.0   | 3.0,2.0   | 3.0,2.0 |
| 11     | Water uptake                | 220       | 220       | 220     |
| 12     | Volume expansion ratio      | 4.0       | 4.0       | 4.0     |
| 13     | Kernel length after cooking | 9.8       | 10        | 10.1    |
| 14     | Elongation ratio            | 1.75      | 1.73      | 1.74    |

biotic stresses to the mundakan varieties of this tract. Makaram is found to be comparatively tolerant to stem borer (score 1.10) and Kumbham is found to be comparatively tolerant to sheath blight (score 1.50). It is also interesting to note that Kumbham is comparatively tolerant to lodging (score 1.50). The thick stem and semi tall stature of this variety attribute to the tolerance to lodging

The farmers in this tract prefer to cultivate Cherady variety although other varieties are

available on account of its grain quality also. The quality analysis of the two varieties are presented in Tale 4. Both these varieties qualify the grain qualities of the Cherady.

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