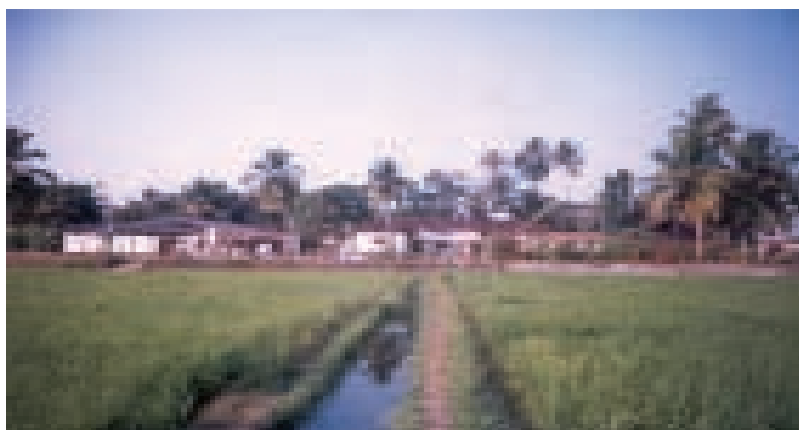


MONCOMPU

Rice Research Station, Kerala Agricultural University Kerala

The Rice Research Station, Monkompuzha is located at Monkompuzha, Thekkekkara of Champakulam Panchayat in Kuttanad Taluk of Alappuzha District. A unit of All India Co-ordinated Rice Improvement Programme started in the year 1974 with an objective to exclusively deal with the research on rice in Kuttanad ecosystem with emphasis on development of rice varieties suitable for this ecosystem.



Major contributions to AICRIP

Crop Improvement

Plant Breeding

- The centre was instrumental in solving several problems in deep water areas such as Kuttanad. The Centre has so far released 22 rice cultivars.
- Most of these varieties are resistant/tolerant to brown plant hopper, gall midge, blast and sheath blight.
- Seven rice varieties developed and released by RRS, Monkompuzha (Mo 13, MO 15, MO 16, MO 17, MO 18, MO 19 & MO 20) were protected under the Plant varieties and Farmer's Rights Act 2001.
- Bhadra (Mo 4), Karthika (Mo 7), Makom (Mo9), Uma (Mo16), Revathy (Mo17) are nationally acclaimed varieties

Varieties released/ identified

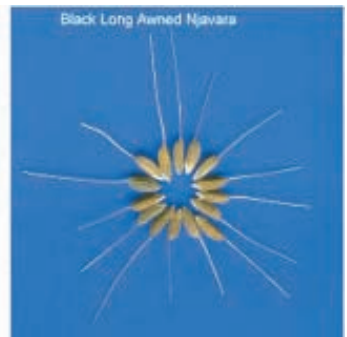
Variety No.	Variety name	Year of release	Pedigree	Important Characteristics
MO.1	Chettivirippu	1945	Pure line selection from Chettivirippu	Resistant to salinity
MO.2	Kallada champavu	1945	Pure line selection from Kallada champavu	Resistant to acidity and salinity
MO.3	Kochathikkira	1968	Pure line selection from Kochathikkira	Resistant to acidity and salinity
MO.4	Bhadra	1978	IR 8/ PTB 20	Resistant to BPH
MO.5	Asha	1981	IR 11-1-66/ Kochuvithu	MR to BPH, sheath blight, sheath rot and bacterial blight
MO.6	Pavizham	1985	IR 8 /Karive nnel	MR to BPH, sheath blight, sheath rot and stack burn
MO.7	Karthika	1987	Triveni/IR 1539	MR to BPH, sheath blight, sheath rot and bacterial leaf blight
MO.8	Aruna	1990	Jaya/ PTB 33	MR to BPH, stem borer, Gall midge, sheath blight, bacterial leaf blight and brown spot
MO.9	Makom	1990	ARC 6650/ Jaya	MR to BPH, leaf folder, stem borer, gall midge, sheath blight, sheath rot and brown spot
MO.10	Remya	1990	Jaya/ PTB 33	MR to BPH, gall midge, sheath blight, sheath rot
MO.11	Kanakom	1990	IR 1561/PTB 33	HR to BPH, MR to stem borer, gall midge, sheath blight, sheath rot, blast and bacterial leaf blight
MO.12	Renjini	1995	Mo.5/Improved Sona	Resistant to Blast
MO.13	Pavithra	1998	Surekha/ Mo.5	R to GM biotype 1 to 5, Tolerant to sheath blight and sheath rot
MO.14	Panchami	1998	Pothana/ Mo.5	R to GM biotype 1 to 5, Tolerant to sheath blight and sheath rot.
MO.15	Remanika	1998	Mo.6/ Pokkali	MR to major pests and diseases.
MO.16	Uma	1998	Cul.12814/ Mo.6	MR to BPH, GM biotype 5. Possess Dormancy.
MO.17	Revathy	1998	Mutant of Mo. 1	MR to Blast, sheath blight and sheath rot. Resistant to BPH and Stem borer
MO.18	Karishma	1998	Mo.1/ Mo.6	R to BPH, moderately resistant to GM biotype 5 and tolerant to iron toxicity and sulphide injury

Variety No.	Variety name	Year of release	Pedigree	Important Characteristics
MO.19	Krishnanjana	1998	Mo.1/ Mo.6	R to BPH, moderately resistant to GM biotype 5 and tolerant to iron toxicity and sulphide injury
MO.20	Gouri	2002	Mo.4/ CuI. 25331	Tolerant to Sheath blight.
Mo.21	Pratheeksha	2010	IET 4786/MO.8	Semi tall, Short duration. Rich in Iron and Zinc

- MO 16 (Uma) is the most popular rice variety of the State currently occupying more than 60 % of the rice area of the State and more than 80% area in Kuttanad.



- Speciality rices - RRS, Moncompu has a sizeable collection of the traditional rice varieties of Kerala including the medicinal rices and aromatic rices. Forty accessions of the medicinal rice Njavara, are maintained in the germplasm and purification of the heterogenous mixture has resulted in the identification of five distinct types of Njavara as detailed below. Breeding programs to improve the yield potential of Njavara is in progress at the station. Pureline selection from the accessions and induced mutagenesis of yellow as well as black Njavara yielded progenies far superior to their parents in yield and phenotypic acceptability.



Crop Production

Agronomy

- The most popular and viable crop establishment method prevailing in the Kuttanad region from 1980 onwards is broadcasting of sprouted seeds.
- Use of seed drill for wet sowing in puddled soils has been found to regulate the plant population, reduce the seed rate to 60-80 kg ha⁻¹, increase the yield and result in higher net profit under standard management practices.
- The different methods of transplanting viz. line planting, planting seedlings raised through dapog nursery, sowing sprouted seeds by seed drill and broadcasting sprouted seeds were evaluated under continuous submergence and cyclic submergence.
- Direct sowing is a viable option in the silty clay soils of Kuttanadu provided optimum weed management and fertilizer management practices are adopted.
- The feasibility studies of using transplanter for mechanical transplanting revealed higher grain yield compared to direct sowing. It was also observed that while the direct sown crop was completely lodged due to heavy rain at the time of maturity, the transplanted crop was not affected. However the use of mechanical transplanter is limited to areas where the soil is having sufficient bearing strength to support the weight of the machine.
- Mechanized transplanting along with early post emergence application of herbicide at 4 DAT followed by one cono weeding at 40 DAT can be adopted as an alternative to broadcasting in areas of high weed infestation.
- Of late, heavy infestation of weedy rice (introgression between *O.sativa*, *O.rufipogon* and *O.nivara*) is becoming a serious threat to rice cultivation in the direct sown rice fields of Kuttanad. The centre has come up with viable management strategy against varinellu (wild rice) in rice by coating seeds with calcium peroxide



Different ecotypes of weedy rice in Kuttanad

Soil Science

- Amelioration of Acidic Soils for enhanced rice productivity - Different soil ameliorants like lime, silica rice husk ash and FYM were recently evaluated along with Recommended Dose of Fertilizer (RDF) in acid soils to achieve higher productivity and production of rice and recommended lime application in direct seeded as well as transplanted rice @600 kg/ha in two split doses to correct soil acidity.
- A study on the best management practice for optimizing grain yield in transplanted rice revealed that NPK @ 90:45:15 Kg/ha + FYM 5 t/ha as basal+ MgSO₄ 20 Kg /ha + lime top dressing @ 250 Kg/ ha recorded significantly higher grain yield than that of farmers practice of applying fertilizer alone @90:45:45 and the recommended dose of fertilizer @90:45:15 +FYM 5 t/ha +lime top dressing @ 250 Kg/ha.
- KAU rice varieties viz., Bharathi, Bhadra, Asha, Karthika, Makom, Gouri, Prathyasa, Vytilla 6 and few selections from the medicinal rice Njavara were found promising in accumulating comparatively higher Fe (23-70 mg/kg) and Zn (37-151 mg/kg) in the grains.
- The soil fertility status of Kuttanad soils have been uploaded in the web portal www.keralasoilfertility.net. Soil Health Card and Nutrient Management Recommendation was generated and distributed to farmers to make them aware of the soil health status of their soils.

Crop Protection

Entomology

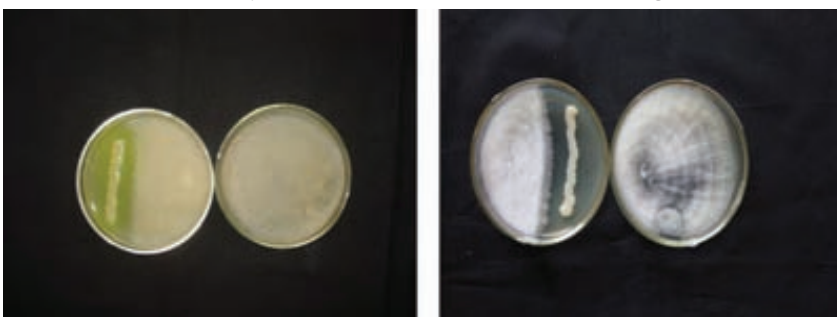
- After the wide spread cultivation of the rice variety Uma (MO 16) which shows very low damage by gall midge the population has come down in Kuttanad and even the susceptible varieties also escaped gall midge attack.
- Studies were conducted on trap crop for stem borer management (TCSB) using stem borer susceptible variety Pusa Basmati I as trap crop and Jyothi as main crop by adjusting the sowing time and found low dead heart damage by stem borer.
- New molecules were identified for controlling leaf folder. Acephate 75 SP @1.6g/l and Flubendiamide (Fame 39.35 SC) 0.35g/l were found effective against leaf folder.
- The combination treatment of Rynaxypyr with Tricyclazole reduced white ear damage significantly showing that there were compatible.
- Four species of stem borers viz., Yellow Stem Borer (YSB), White Stem Borer (WSB), Pink Stem Borer (PSB) and Striped Stem Borer (SSB) were present in Kuttanad. White stem borer was higher at tillering stage while that of yellow

stem borer was higher at heading stage.

- Of the 26 natural enemies identified, twelve were parasitoids and many of which were first reports from Kerala.
- An Integrated pest management strategy has been worked out for Brown Plant hopper of rice.
- An indigenous cheap and efficient rat trap "the Moncompu trap" has been designed for trapping rats in rice fields. Novel methods for rat control by use of rat traps, using food baits like raw tapioca or lemon peel etc have been demonstrated to farmers and are being successfully used by farmers now.

Plant Pathology

- The major diseases in rice include neck blast, sheath blight, brown spot, sheath rot and bacterial blight.
- Out of the total 9080 cultures i.e, NSN-1 (3079), NSN-2 (8340), NHSN (1253), DSN(1594)) screened against blast, sheath blight, brown spot, sheath rot and bacterial leaf blight, 1362 cultures showed multiple resistance for all major diseases.
- Sheath blight disease was observed in low to moderate intensity in Swarna, Tapaswini and TN-1 in all three dates of planting. It was very low in normal and late planted crop of Uma and IR 50. Low to moderate incidence of Bacterial leaf blight was recorded in early and normal planted crop of Swarna, Tapaswini and TN-1. In late planted crop, the incidence was very low in all the varieties except IR 50.
- The biocontrol agent *Pseudomonas fluorescens* being mass multiplied and the talc formulation of the same are being distributed to the farmers from the station from 2008 onwards for encouraging the eco-friendly management of plant diseases. Many of the farmers adopt seed treatment with *Pseudomonas fluorescens* to control the seed borne diseases of rice. Foliar application of the same is also followed by the farmers. New native isolates of *Pseudomonas fluorescens* and *Bacillus sp.* were identified for the management of false smut.



New native isolates of *Pseudomonas fluorescens* & *Bacillus sp*