REGIONAL AGRICULTURAL RESEARCH STATION
PATTAMBI

History

The Regional Agricultural Research Station, Pattambi, has entered the seventh decade of activities. Operated by the Kerala Agricultural University, the station was established on March 12, 1927, with the name, Paddy Breeding Station, Pattambi. The land was provided by the revenue authorities of Malabar district. This was the fourth Paddy breeding station sanctioned by the Government in persuance of the policy to provide facilities for improvement of 'local paddies' in the chief rice growing areas of the Madras Presidency. The first rice breeding station was opened at Coimbatore in 1915, the second at Aduthurai in 1922, the third at Maruteru in 1925 and the fourth at Pattambi in 1927.

The station was formally declared open by Mr. Viscount Goshen, Governor of Madras Presidency on October 12, 1928.

The name of the station was changed to Agricultural Research Station, Pattambi in 1930 so as to take up investigations on other crops also like cotton, sugarcane, sesame, groundnut and pulses.

With the re-organisation of states in 1956, the station was transferred to the Kerala State. It continued to function as the main institution for rice research in Kerala. In 1962, when the rice research setup of the state was re-organised, this station was raised to the status of a Central Rice Research Station

for the Kerala State with regional stations at Mannuthy, Chalakudy, Vyttila, Kayamkulam, Moncompu and Karamana. The headquarters of the Rice Specialist was shifted from Mannuthy to Pattambi. In the changed setup, six divisions took shape: plant breeding, agronomy, chemistry, entomology, plant pathology and statistics. Besides, a full-fledged seed testing laboratory was established which was later on nominated as the State Seed Testing Laboratory. An Agricultural Meteorological Laboratory was set up in 1948 under the Co-ordinated Crop Weather Scheme.

With the formation of the Kerala Agricultural University, the Rice Research Station, Pattambi, was transferred to the University on February 1, 1972.

With the implementation of National Agricultural Research Project (NARP) in 1981, the station was reorganised as Regional Agricultural Research Station of the Central Zone. The lead function of the station is to conduct research on rice, pulses, horticultural crops and rice-based farming systems. The station also functions as an advanced centre for studies on laterite soil management. Now, the research activities of the following research stations of the NARP Central Region come under the control of the Associate Director of the Regional Agricultural Research Station, Pattambi.

* Agricultural Research Station, Mannuthy
* Agronomic Research Station, Chalakudy
* Banana and Pineapple Research Station, Kannara/Vellanikkara
* Cashew Research Station, Madakathara and Anakayam
* Aromatic and Medicinal Plants Research Station, Odakkali

At present, the following projects financed by the Indian Council of Agricultural Research are also functioning in this institution.

1. All India Co-ordinated Rice Improvement Project
2. All India Co-ordinated Project for the intensification of Research on pulses
3. National Seed Production - Breeder Seed Production unit

Location, physiography and climate

The research station is situated within a kilometre east of the Pattambi Railway station along the Pattambi - Perintalmanna road.

Lattitude	:	10° North
Longitude	:	76° East
Elevation	:	25 metres MSL
Total geographical area	:	63.64 ha.
Double crop wet land	:	19.88 ha.
Single crop wet land	:	11.17 ha.
'Modan' land	:	10.85 ha.
Garden land	:	20.32 ha.
Total annual rainfall	:	2645 mm
Rainfall during 'virippu' (June-September)	:	1765 mm
Rainfall during 'mundakan' (October-January)	:	480 mm
Rainfall during 'punja' (January-April)	:	400 mm
Average number of rainy days per year	:	111
Maximum temperature	:	32.2° C
Minimum temperature	:	22.4° C

Land and Soil

The station's 63.64 hectares area includes all the main representative types of land of Kerala: 'modan' (fainfed upland), 'palliyal' (single crop wet land) and 'iruppu nilam' (double crop wet land)

The ridges and slopes of low hills form the bulk of the 'modan' paddy area. The soil is gravelly and overlies directly the undecomposed rock below. Due to unevenness water cannot be impounded in the fields to raise swamp rice.

'Palliyals' are high level terraced lands. The plots are generally small and there is a considerable drop in level from field to field. The soil is extremely shallow and porous.

'Irippu nilams' are typical wet lands. The fields are fairly large and even. The soil is deep and moderately fertile.

The soils of the farm are sandy loam derived from low level laterite, with a pH range of 5.2 to 5.8.

The entire area is rainfed being typical of the general conditions prevailing in the state. There are a few wells and tanks spread over the low lying area which help to supplement the rain whenever necessary.

Research activities - an overview:

The research activities of the station are spread over five disciplines: Varietal improvement,

agronomy, soil science, entomology, plant pathology and extension. The highlights of the works and achievements accomplished so far are presented below.

Varietal improvement:

From ptb-1 to ptb-52 this station has proudly presented 47 varieties to the rice front of India. Most of these varieties are popular due to their suitability to the diverse agro climatic conditions and needs of the rice farmers of Kerala.

Improvement of the popular local varieties through selection was the main breeding programme till the sixties. By selection, 36 strains have been released. Of these 'Kattamodan' (ptb 28), 'Karuthamodan' (ptb 29) and 'Chuvannamodan' (ptb 30) were evolved through mass selection and the others through pureline selection. The first strain to be released from this station was ptb 1 (Aryan) in 1934.

Among the earlier selections many have got international acceptance as donors for various pests and diseases. Ptb 18 and Ptb 21 are resistant to stem borer, gall midge and 'tungro' virus. Ptb 7 is resistant to foot rot and gall midge. Ptb 19 and Ptb 33 have been universally acclaimed as varieties resistant to brown plant hopper. Ptb 12 is tolerant to bacterial leaf blight disease.

Ptb 28, Ptb 29, Ptb 30 and Ptb 42 are suitable for cultivation in the 'modan' uplands. They are tolerant to drought. Ptb 15 and Ptb 16 are resistant to low flooding and waterlogging. Ptb 22, Ptb 23 and Ptb 24 are suitable for cultivation in the sandy areas. Ptb 23 is credited with a high protein content of 12.5 per cent.

'Thekkan Cheera' (Ptb 10), an early duration photoinsensitive variety deserves special mention as it has won name and fame even in other rice cultivating countries. It contributed towards the development of most of the short duration high yielding dwarf varieties released in Kerala.

'Chennellu', a mass selected variety, is suitable for cultivation under shade, for example, in coconut gardens.

Varieties having national and international acclaim were introduced and their performance studied in this station. First strain introduced was Adt 3, evolved at Aduthurai. It faired badly at Pattambi. Other important introductions made were: GEB 24, Co 25, IR 8, T(N) 1, Tainan-3, Jaya, IR 20 and Mashuri. Many of these varieties were well accepted by the farmers of Kerala. Varieties like Mashoori, Co 25 and Jaya still continue to be popular in some parts of Kerala. Some of the introduced strains were used in crossing programmes.

An intensive programme was undertaken to develop high yielding strains with wide adaptability to different agroclimatic regions in Kerala by hybridisation and selection using the introduced high yielding dwarf indica types. This resulted in the development of several

hybrid derivatives of which the first one 'Annapoorna' (Ptb 35) was released in 1966. It incidentally was the first high yielding, early duration dwarf rice to be released in India. Known popularly as Culture 28, it has played an important role in augmenting rice production in the state.

The other high yielding varieties released in this category are Rohini, Aswathy, Triveni (1971), Jyothy, Bharathy, Sabari (1974), Swarnaprabha (1985), Jayathy and Neeraja (1989).

Mutation breeding was also attempted in rice which led to the evolution of 'Rashmi' a mutant from 'Orpandy' by gamma irradiation.

The varieties released from the station namely, viz. Nila, Red Triveni, Neeraja and Jayathy have already won the appreciation of the farmers. Jayathy (Cul-1727) has the rare distinction of being the highest yielder in the International Rice Testing Programme conducted at 43 locations in 18 countries in 1983-84. It has shown resistance to all the three biotypes of Brown Plant Hopper at IRRI.

With the newer emphasis on integrated pest and disease management, the focus has been made in evolving rice varieties having multiple resistance to major pests and diseases. Considering the multiple resistance to blast and Sheath blight, four new varieties viz. Kairali (Ptb-49), Kanchana (Ptb-50); Aathira (Ptb-51); and Aiswarya (Ptb-52) were released in the year 1993 for general cultivation.

Salient features of Rice varieties released from R.A.R.S., Pattambi

Sl. No.	Strain No.	Name of variety	Duration days)	Parentage	Stature	Special features
1	2	3	4	5	6	7
1.	PTB-1	Aryan	145	Pureline selection from Aryan	Tall	Red Kernelled - suited for first crop
2.	PTB-2	Ponnaryan	135	Pureline selection from Ponnaryan	-do-	-do- -do-
3.	PTB-3	Eravapandy	128	Pureline selection from Eravapandy	-do-	Red Kernelled - season bound II crop variety
4.	PTB-4	Vellari	140	Pureline selection from Vellari	-do-	-do- -do-
5.	PTB-5	Veluthari kayama	145	Pureline selection from Veluthari kayama	-do-	Red Kernelled - suited for first crop & water logged areas
6.	PTB-6	Athikraya	145	Pureline selection from Athikraya	-do-	Red Kernelled - season bound second crop variety
7.	PTB-7	Parambuvattan	120	Pureline selection from Parambuvattan	-do-	Red Kernelled - Awned, black glumed first crop variety tolerant to gall fly and foot rot

1	2	3	4	5	6	7
8.	PTB-8	Chuvannari Thavalakkannan	130	Pureline selection from Thavalakkannan	Tall	Red Kernelled - first crop variety
9.	PTB-9	Veluthari Thavalakkannan	130	-do- -do-	-do-	White kernelled - first crop variety, tolerant to gall fly and foot rot
10.	PTB-10	Thekkancheera	90-100	Pureline selection from Thekkancheera	-do-	Red kernelled - variety for all seasons.
11.	PTB-11	Halliga	145	Pureline selection from Halliga	-do-	White Kernelled - First crop variety
12.	PTB-12	Chitteni	130	Pureline selection from Chitteni of South Malabar	-do-	Red Kernelled - black glumed, season bound second crop variety
13.	PTB-13	Kayama	140	Pureline selection from Kayana	-do-	Red Kernelled - First crop variety
14.	PTB-14	Maskathi	130	Pureline selection of Maskathi	-do-	White riced - first crop variety
15.	PTB-15	Kavungin-poothala	165	Pureline selection from Kavunginpoothala	-do-	White Kernelled - season bound second crop variety - suited for "Karinkora"

1	2	3	4	5	6	7
16	PTB 16	Kavungin Poothala (early)	135	Pureline selection from Kavungin Poothala	Tall	White kernelled, season bound second crop variety. Suited for "Karinkora"
17	PTB 17	Jeddu Halliga	145	Pureline selection from Jeddu Halliga	-do-	Red riced, first crop variety
18	PTB 18	Erava Pandy	130	Pureline selection from Eravapandy	-do-	Red riced, season bound second crop variety
19	PTB 19	Athikraya	145	Pureline selection from Athikraya	-do-	-do- -do-
20	PTB 20	Vadakkan Chitterni	125	Pureline selection from Chitteni of North Malabar	-do-	-do- -do-
21	PTB 21	Thekkan	125	Pureline selection from Thekkan	-do-	-do- -do-
22	PTB 22	Velutha Vattan	120	Pureline selection from Veluthavattan	-do-	Red riced first crop variety suited to sandy areas
23	PTB 23	Cheriya Aryan	110	Pureline selection from Cheriya Aryan	-do-	Red kernelled, first crop variety suited to sandy areas
24	PTB 24	Chuvanna Vattan	115	Pureline selection from Chuvenna Vattan	-do-	-do- -do-

1	2	3	4	5	6	7
25	PTB 25	Thonnuran	120	Pureline selection from Thonnuran	Tall	Red kernelled, first crop variety suited to sandy areas
26	PTB 26	Chenkayama	125	Pureline selection from Chenkayama	-do-	-do-
27	PTB 27	Koliyan	130	Pureline selection from Koliyan	-do-	Red kernelled, season bound second crop variety
28	PTB 28	Kattamodan	120	Mass selection from Kattamodan	-do-	Red kernelled first crop variety for uplands
29	PTB 29	Karuthamodan	110	Mass selection from Karuthamodan	-do-	Red kernelled black glumed first crop variety for uplands
30	PTB 30	Chuvannamodan	110	Mass selection from Chuvannamodan	-do-	Red kernelled first crop variety for uplands
31	PTB 31	Elappapoo Champan	110	Pureline selection from Elappapoo Champan	-do-	Red kernelled, first crop variety
32	PTB 32	Aruvakkari	125	Pureline selection from Aruvakkari	-do-	-do-

1	2	3	4	5	6	7
41	PTB 41	Bharathy	120-125	PTB 10 x IR 8	Semi Dwarf	Red kernelled, medium duration variety for all seasons
42	PTB 42	Suvarna mo an	110-115	Pureline selection from ARC 11775	Tall	White kernelled, variety for uplands
43	PTB 43	Swarna-prabha	100-105	Bhavani x Triveni	Medium Tall	White kernelled, short duration variety for all seasons blast resistant and also suitable for 'modan'
44	PTB 44	Rasmi	150-180	Gamma induced mutant of Oorpandy	Tall	Red kernelled, season bound second crop variety suitable for 'Kosttukundakan'
45	PTB 45	Red Triveni	90-105	Pureline selection from Triveni	Semi dwarf	Red kernelled, short duration variety for all seasons
46	PTB 46	JAYATHY	120	Thriveni x IR 2061	-do-	White kernelled short duration variety adapted to all the three seasons. Resistant to all three biotypes of BPH, GLH, leaf folder and blast
47	PTB 47	NEERAJA	130-140	IR-20xIR-5	Semi tall	White riced variety suited to the poonthalpadam areas of Chittoor Taluk

1	2	3	4	5	6	7
48	PTB 48	Nila	140-160	CO 25 x Triveni/ Vellathil Kolappala	Tall	Red riced-season bound suited for II crop moderate resistance to sheath blight
49	PTB 49	Kairali	110-115	IR 36 x Jyothi	Semi dwarf	Red riced suited for all the 3 seasons. Kairali is tolerant to sheath blight and Kanchana to blast and sheath blight
50	PTB 50	Kanchana	110-115	IR 36 x Pavizhom	-do-	
51	PTB 51	Aathira	120-130	BR 51 x 23332-2	Semi tall	Red riced-photo insensitive - suited for I & II crop - moderate resistance to blast & sheath blight
52	PTB 52	Aiswarya	120-130	Jyothi x BR 51	-do-	-do-

special varieties in the following lines.

* Special season bound tall varieties for 'mundakan' season.

* Varieties for dry sown 'Virippu' crop.

* Reselection in Mashuri for red kernel colour and stress tolerance.

* Improved varieties for ill drained areas of Kerala.

* Breeding for rice varieties resistant/ tolerant to sheath blight.

Hybrid Rice Programme

In order to utilise heterosis in rice, hybrid-rice programme was initiated at the Centre. The objective of this programme is to identify and evolve male sterile line, maintainers, restorers and hybrid combinations suited for Kerala conditions.

Crop management:

A large number of cultural, manurial and herbicidal trials have been conducted in this station from 1927 onwards.

Manurial trials have revealed many important findings which enabled to formulate appropriate manurial schedules for the different agroclimatic regions.

A combination of organic and inorganic manures was found to be superior to either of them alone for swamp rice. There is universal response to nitrogen and it is the nutrient that limits production in the majority of the soils. Response to nitrogen of the tall indica varieties was linear upto 6.7 kg/ha and thereafter the law of diminishing returns set in. In the case of early and medium duration dwarf varieties, there was response upto 94 kg and 122 kg respectively, per hectare.

Split application of nitrogen at the early vegetative and reproductive phases has been found to be better than single application at planting. Application of nitrogen at the reproductive stage is highly helpful to increase spikelet number and ear weight. The best time to top-dress nitrogen is 7 days prior to panicle initiation and not exactly at the panicle initiation stage. Application of nitrogen at panicle initiation and heading stages increases grain yield, protein content and recovery of head rice. Experiments have proved that foliar application of nitrogen in the form of urea can be advantageously adopted in rice manuring. A combination of soil and foliar application is better than soil

or foliar application alone. Placement of nitrogen in the reduced zone of soil has been observed to double the nitrogen use efficiency indicating that the dose of nitrogen can be reduced considerably by placement techniques. Comparison among the nitrogenous fertilizers showed that urea and ammonium sulphate are superior to the others. On equal nitrogen basis, sulphur coated urea, shellac coated urea and isobutytedene diurea are far superior to ordinary urea when applied entirely at planting. Application of granular urea in 3 or 4 splits during appropriate growth stages produces equal or better nitrogen use efficiency compared to the slow release materials.

Investigations on the manuring of upland rice have revealed that application of nitrogen at seedling increases the foraging capacity of roots and enhances drought tolerance.

Recent studies indicate that under transplanted condition during Kharif and Rabi seasons fertilizer requirement for Mashoori variety of rice is 50:25:25kg NPK/ha. During kharif season, application of N in 4 equal splits (25% N as basal, 25% at 20 DAT, 25% at 40 DAT and 25% at 60 DAT was found to be the best) and during rabi season, the optimum time of application for N was 25% as basal, 25% at 20 DAT and 50% at 40 DAT.

Gypsum coated urea (GCU) and neem coated urea (NCU) showed better performance as well as higher (N) recovery than prilled urea and mussooriephos coated urea, irrespective of the rate of application (30, 60 and 90kg N/Ha)

Studies on Volatilisation loss of 'N' from rice soils revealed that nitrogen loss through ammonia volatilization from submerged soils recorded 5.3 percent of applied N during viruppu season and 9.5 percent during mundakan season. Upto 75 percent loss occurred during the first 6 days. The relative efficacy of different N carriers in reducing the ammonia volatilization loss has been obtained from this trial. Combined application of urea and muriate of potash was found to reduce volatilisation loss of Ammonia compared to application of urea alone.

Sulphur coated urea is found to be the best form for increasing efficiency of fertilizer nitrogen in transplanted rice.

Response to phosphorus and potash has been found to be erratic and inconsistent. All the 3 forms of phosphorus - water soluble, citric acid soluble and insoluble - are equally good for water logged rice. Finely powdered rock phosphate shows slightly better fertilizing efficiency compared to super phosphate. Split application of potash may be more advantageous under conditions of heavy rains and in sandy soils.

Fractional application of lime at planting, tillering and panicle initiation stages has been observed to be relatively more effective than the present practice of applying lime only as basal dressing. Studies on 'bronzing disease' of rice have shown that the disease can be effectively controlled by top dressing lime at the rate of 1000 kg/ha immediately

after the manifestation of symptoms.

Some of the recent studies conducted on the fertilizer requirement of selected cropping systems showed that in places where green manure - rice - rice cropping system is in practice the virippu and Mundakan rice need be given only 75 percent of the fertilizer dose for each season or 50 percent for virippu and 100 percent of the dose for both the seasons. The Virippu and Mundakan crop received no organic manure except the green manure incorporated before the virippu crop. The fertilizer requirement study of fallow-rice-rice cropping system revealed that application of 50 percent of the fertilizer dose for virippu and 100 percent for the Mundakan crop of 75 percent of the full dose during each season is sufficient instead of giving full dose for both the seasons. The Virippu and Mundakan crop received cattle manure @ 5t/ha in addition to the fertilizers.

A recent study on the use of Azolla as a biofertilizer for rice was undertaken and it revealed the following facts: A course textured soil (with near neutral p^H, and reasonable phosphorus availability, coupled with cooler climate are the factors favouring the growth of azolla in the coastal areas of Kerala. Addition of phosphorus was found to favour the growth and quality (in terms of nitrogen content) of Azolla. In places where light intensity and temperature are unfavourable for the growth of Azolla bulk method or random planting of rice adopted by the farmers facilitated the growth of azolla as a concurrent crop with rice. This was found

better than line plantings tried. Water, temperature and light intensity below the canopy was minimum in this method of planting. Azolla inoculation at one week after planting was found better during first crop season. For second crop season, inoculation at three weeks after planting was found to be better, when the temperature and solar radiation were unfavourable for the concurrent crop of azolla. Substitution of cattle manure by azolla at 5t/ha can save 25 percent of fertilizer dose.

Studies on the time of planting of rice revealed that planting the first crop beyond the 15th of July and the second crop beyond the third week of October definitely reduces the yield.

Planting seedlings at a depth of 3 to 4.5 cm has been found to be the best. Shallow planting helps to increase the tillering ability of seedlings.

Trials conducted on methods of planting have shown that dibbling sprouted seeds in puddle is superior to broadcasting in respect of yield and yield components. It has also recorded higher productivity per day compared to transplanting. In areas where there are facilities for water control, this method can be suitably advocated.

The optimum plant density for the medium deviation dwarf indica varieties is 33 hills/M^2 (15 x 20 cm) during the cloudy first crop season and 50 hills/M^2 (10 x 20cm) in the second crop season. A Plant density of 67 hills/M^2 (10 x 15cm) is the best for the early duration rices for all the three seasons.

കേരള കാർഷിക സർവ്വകലാശാല

കേരസൗഭാഗ്യ

കേരള കാർഷിക സർവ്വകലാശാലയുടെ പിലിക്കോട് പ്രാദേശിക ഗവേഷണകേന്ദ്രത്തിൽ നിന്നും പുറത്തിറക്കുന്ന അഞ്ചാമത്തെ സങ്കര തെങ്ങിനമാണ് 'കേരസൗഭാഗ്യ'

സങ്കരം

പശ്ചിമതീരനെടിയ ഇനം X സ്ട്രെയ്റ്റ് സെറ്റിൽമെൻറ് ആപ്രിക്കോട്ട്

ഉൽപ്പാദനം

- ഒരു തെങ്ങിൽ നിന്നും ലഭിക്കുന്നവർഷിക വിളവ് 100 മുതൽ 160 തേങ്ങകൾ വരെ
- കൊപ്രയുടെ തൂക്കം - 200 ഗ്രാം ഒരു തേങ്ങയിൽ നിന്നും
- ഒരു തെങ്ങിൽ നിന്നും ശരാശരി 25 കി.ഗ്രാം കൊപ്ര ലഭിക്കുന്നു

മറ്റു പ്രത്യേകതകൾ

- ഉൽപാദനത്തിലെ സുസ്ഥിരത
- 5 വർഷത്തിനുള്ളിൽ കായ്ച്ചു തുടങ്ങുന്നു
- പ്രതികൂല സാഹചര്യങ്ങളെ ചെറുത്തു നിൽക്കുവാനുള്ള കഴിവ്
- കേരളത്തിലുടനീളം കൃഷിക്ക് അനുയോജ്യം

Chemical control of weeds has been found to be effective and economical in the uplands as well as the wet lands. Propanil, butachlor, nitrofen, benthiocarb, Ronstar and penoxalin are highly effective against a wide spectrum of weeds in the rice fields. Recently pendimethalin (1.0kg ai/ha) along with one handweeding has been found to be a very effective control of grassy weeds in direct sown rice grown under semi dry condition.

Water management trials undertaken in this station for the different seasons indicated that 5 cm irrigation once in 6 days will be adequate for mundakan rice when irrigation water is available and for summer rice 5cm irrigation 2 days after the disappearance of ponded water is sufficient.

Crop protection

Several trials have been conducted to devise effective control measures against some of the major pests and diseases of rice.

Control measures against the major pests of rice, namely, stem borer, gall midge, leaf roller, rice bug and brown plant hopper have been recommended from this station. Various chemicals in different formulations were evaluated for their efficacy in controlling these pests.

The first Indian record of Hydrellia philippina Ferino (whorl maggot) infesting rice seedlings was made from this station. Another pest Haplothrips ganglibauri attacking the emerged panicles was also

recorded at Pattambi for the first time in India. Moreover, most of the Ptb strains belonging to the tall indica group have got resistance to major pests of rice and these are being utilised as donor parents in resistance breeding work all over the country and abroad.

Chemical control measures for subjugating leaf roller epidemics which have assumed serious proportions in the state were suggested from this research station. The effectiveness of carbofuran against brown plant hopper was recognised from various trials conducted here. Trials on seedling root dip in chemical solutions, viz. Dursban, Mipcin and recently chlorphyriphos proved effective measures against rice pests in the early vegetative phase. Joint application of carbofuran and urea proved increased grain yields in rice besides controlling important rice pests. The multiple resistance of 'Rashmi' to leaf roller and gall midge was reported from this station. The resurgence of rice leaf folder on application of carbofuran 3G was also reported based on various trials. The effectiveness of two new chemicals, viz. 'Padan' and 'Trebon' has been reported for the control of stem borer and leaf folder.

In Plant Pathology, studies on major rice diseases like blast, sheath blight, brown spot and bacterial leaf blight were taken up. Rice varieties were screened to assess their reaction to major rice diseases. The efficacy of many new chemicals against blast and sheath blight has been pointed out from here. Economic spray

schedules for the control of major rice diseases have been recommended. The effectiveness of Hinosan and Bavistin against blast, Dilthane Z - 78 & Dithane M-45 against brown spot, Topsin - M 70 WP for blast and sheath blight and validacin against sheath blight reported from this centre have been transferred to the farmers for general adoption through Package of Practices Recommendations. Similarly chemicals like Fongorene 50 WP, Beam 75 WP and Bavistin 50 WP were found as good seed protectants in controlling seedling blast. A simple low cost and pollution free method has been devised by the Scientists of this station for the control of the dreaded bacterial leaf blight disease of paddy i.e., spraying fresh cowdung extract at an interval of 10 days. This is the first world record for the biological control of bacterial leaf blight disease. Similarly Rhynchosporium oryzae causing the leaf scald disease of rice was reported for the first time in India from this station.

Other crops

Pulses

Earlier works (1930-'40) at Pattambi on the improvement of horsegram, blackgram and cowpea by pure line selection did not yield the desired results. A scheme for research on pulses was commenced at Sasthamkotta in Kollam district in 1963 with financial assistance of the ICAR. Later on it was shifted to the Rice Research Station, Pattambi, in 1966 in view of better facilities. This scheme was terminated in 1968 and thereafter continued as a state scheme. A new scheme for the intensification of research on pulses as a part of the All India Co-ordinated Pulses

improvement Project was started in November, 1976 with the financial support of the ICAR.

The most significant accomplishment of the research project on pulse crops is the release of an early duration cowpea variety 'Kanakamony' (Ptb 1) in 1977. It is a dual purpose strain (as grain and vegetable) evolved by pure line selection from a popular variety Kunnamkulam local. This, incidentally, is the first variety of cowpea to be released in the state. Following this, a grain type cowpea variety 'Krishnamony' (Ptb-2) with black seed colour was released from this station.

Recently two promising cowpea cultures (Cul.7 and Cul.9) were evolved by crossing 'Krishnamony' with 'Kanakamony' so as to improve the black seed colour of the former parent. These two cultures exhibit ideal characters of a grain type with short duration, synchronised flowering and maturity with the seed colour of Kanakamony and out yielded Krishnamony. These two cultures are expected to be released shortly.

Under the All India Co-ordinated varietal trials on Pulses, the best varieties and cultures nominated by various states and finalised at National Pulses workshop are tested for their yield performance for the region. Some of the varieties which were found promising in the Co-ordinated trials are as follows:

Cowpea	..	V-240, GC-3, Amba (V-16).
Greengram	..	PS-16, PDM-84-143, Pusa-103, Pusa-117, RMG-146, ML-5.
Blackgram	..	LBG-17, PDU-5, UH-80-9, T-9, PANT-U-30.

Horticultural crops

Studies conducted on horticultural crops during 1988-89 revealed that two varieties of watermelon, viz. 'sugar baby' and 'Fuken' are suitable for riverbed cultivation. The mosaic resistant bhindi varieties sel.4 and sel.10 are ideal for riverbed cultivation.

Tapioca varieties, viz. Sreeprakash, Co-2 and H.165 are suitable for rice fallows.

Seed Testing programme

A Seed Testing Laboratory was established at the Central Rice Research Station, Pattambi as per section 4(2) of the Central Seed Act-54 of 1966. This is a seed testing laboratory notified under seed act, 1969, for Kerala State. Apart from the routine seed testing works, research data on seed storage, seed viability, seed dormancy etc., were generated from this laboratory and transferred to researchers seed multiplication agencies and extension personnel.

Till 1978, this laboratory catered to the needs of the entire Kerala State. With the declaration of the Seed Testing Laboratory, Alapuzha as a State Seed Testing Laboratory, the service area of the laboratory at Pattambi has been confined to the districts of Thrissur, Palakkad, Malappuram, Kozhikode, Cannoor and Wynad. From 1966 to 1992, this laboratory has analysed 32,523 seed samples received from various sources.

Studies done in 1973 on the volume expansion of 18 tall indica rice varieties revealed an average increase of 402.2 per cent in volume expansion on cooking, the highest being recorded by Ptb 29 and the lowest by Ptb 32.

Studies conducted in 1984 have revealed that seed treatment with Thiride, Captan and Foltaf are effective seed dressing fungicides.

Recently, the Seed Testing Laboratory, Pattambi has been strengthened by the implementation of the National Seed Production - Breeder Seed Production Unit (NSP-BSP Unit).

Seed Multiplication and distribution

Multiplication of nucleus seeds of rice for the 33 state seed farms of Kerala is an important responsibility of the Regional Agricultural Research Station, Pattambi. Besides nucleus seeds, foundation seeds are also produced for distribution among the cultivators. There has been considerable demand for the seeds produced by this station. Both the state department of Agriculture and the rice farmers of Kerala attach high credibility to the quality seeds distributed from here.

Extension Activities

The station maintains close linkage with the various departments and agencies for the effective transfer of technology generated by the Scientists. The scientists assist the state department of Agriculture in conducting the monthly T & V workshops. These workshops finalise the messages to be communicated to the farmers based on research results, feedback from the farmers and extension personnel.

In the annual regional workshops the research highlights are presented by the Scientists and results of the farm trials and field problems by the departmental officers. Action programme of research and farm trials are decided in this workshop.

The Scientists perform joint field visits with the department personnel as members of diagnostic team. On-farm trials are also conducted with the help of the Department of Agriculture.

Various trainings to the extension officers, farmers and undergraduate students of Agriculture are being imparted from this station.

The Krishi Vigyan Kendra (KVK) located in this station organises short training programmes for farmers, women and youth on Agriculture, Animal Husbandry, Fisheries and Home Science.

In collaboration with the soil conservation department and the state Agriculture department an Operational Research Project is functioning at Ozhalapathy.

Publications

Research articles based on the results emulating from trials conducted in this station are published in the leading journals of the country and abroad. Scientists regularly contribute popular articles to the newspapers. So far, about 300 papers have been published.

Following three Books of the Scientists of this station were published by the Kerala Agricultural University.

1.	Subeejam Sukshethre	.. Prof. V.P. Sukumara Dev.
2.	Samrudhiyude Vithukal	.. Prof. V.P. Sukumara Dev Smt. C.A. Rosamma Smt. C.R. Elcy
3.	Aryan Muthal Aiswarya Vare	.. Smt. C.A. Rosamma Smt. C.R. Elcy Dr. K.M. Rajan

RESEARCH PROJECTES IN OPERATION

Crop Improvement Division

1. RIC-01-00-01/72 PTB KAU

Genetic conservation of rice germplasm - collection, maintenance, cataloguing and evaluation.

A germplasm collection of 300 entries including rice varieties released from Kerala and other States are maintained. Cataloguing is in progress.

2. RIC-02-01-20/91 PTB-9-ICAR Coord.

Advanced yield trial - Irrigated mid early (AYT - IME)

In this trial promising rice cultures produced at various co-operating centres of AICRIP are tested under Pattambi conditions. 31 entries including local check has been planted in replicated yield trial.

3. RIC-02-01-20/91 PTB-9-ICAR Co-ord.

Advanced yield trial - Early (AYT-E).

In this trial promising cultures produced at various co-operative centres of AICRIP are tested under Pattambi condition.

4. RIC-02-01-20/91 PTB (9) ICAR Co-ord.

Advanced Yield trial - Shallow Water (AYT - SI)

In this trial performance of rice cultures under shallow water conditions are evaluated.

5. RIC-02-01-20/91 PTB (9) ICAR Co-ord.

Advanced Yield trial - Basumathi.

In this trial Basumathi cultures will be tested along with the local checks and poosa Bhasumathy.

6. RIC-02-01-20/91 ICAR Co-ord.

Advanced Variety Trial - Irrigated mid early (AYE-IME)

Thirty one cultures including Rathnavikas as national check will be tested during kharif season of 1993.

7. RIC-02-01-19/91 PTB (9) ICAR Coord.

Initial yield trial - Very Early (IYT-VE)

In this trial promising entries nominated from all the co-operating centres are tested.

8. RIC-03-03-09/88 PTB (9) KAU

Breeding lodging resistant rice varieties for dry sown conditions during Virippu season.

The objective is to evolve a variety best suited for dry sowing. High Yielding popular rice varieties of Kerala and newly evolved varieties are tested for identifying suitable variety under such conditions.

9. RIC-06-00-02-PTB(9)/87 KAU

Reselection in Mahsuri for red kernal colour and blast resistance.

Red kernelled plant types were noticed in the foundation seed lot. A reselection programme was started to isolate red kernelled Mahsuri plants with tolerance to biotic stress. Among this RM-1 is found most promising.

10. RIC-05-00-02/76 PTB-KAU

Breeding high yielding tall photosensitive varieties with good straw specifically suited for the mundakan season of Kerala.

In order to evolve a high yielding variety for the second crop season of Kerala a breeding programme using PTB-20 and Co-25 as parents was taken up. A total number of 14 cultures were promoted. Two most promising cultures evolved are under farm trial stage.

11. RIC-02-01-02/90 PTB-KAU

Genetic improvement of promising indica varieties through idiotype breeding.

The yield and yield attributing characters of tall indica varieties and their hybrid derivatives are noted and genetic analysis of these characters are now in progress.

12. RIC-06-00-01/83 PTB-KAU

Improvement of rice varieties BR-51 and IR-36 for consumer acceptability.

BR-51 and IR-36 are two rice genotypes performing well under Kerala condition. They are having white long slender grains and hence their acceptability among Kerala farmers are poor. To improve their grain characteristics for better consumer acceptibility, popular high yielding varieties were crossed with these two. Four promising cultures evolved from this was released as Kairali, Kanchana, Aathira and Aiswarya. Two more cultures are also in the farm trial stage.

13. RIC-03-02-06-PTB-5-83-KAU

Breeding high yielding rice varieties resistant/tolerant to Sheath blight.

Cul-25331 which is identified to have tolerance to Sheath blight disease is crossed with Jyothi & Triveni. Fresh crossing programmes between HYV and identified donars with Sheath blight resistance will be undertaken.

14. Research on hybrid rice - KAU Annual Plan

Identification, evaluation, purification and selection of male sterile lines, maintainer lines, restorers and hybrid combinations to evolve rice hybrid suited to Kerala conditions.

Crop Production Division

1. RIC-10-00-01-PTB-1-88-ICAR Coord.

Weed control trial for direct sown rice under semi-dry conditions (AICRIP)

Application of butachlor, pendimethalin and pretilachlor (higher dose) either alone or the lower dosage of these herbicides (except pretilachlor) when used in conjuction with 2,4-D Na exhibited high degree of weed control efficiency.

2. RIC-10-00-06-PTB-1-91-ICAR Coord.

Economics of weed control for direct sown rice under semi-dry system of cultivation (AICRIP).

Among the various weed management treatments, application of butachlor @ 1.50 kg a.i./ha recorded the maximum grain yield, net income and marginal B:C ratio.

3. RIC-11-00-02-PTB-01-89-ICAR Coord.

Maximisation of rice yield under transplanted conditions (AICRIP)

Treatments receiving FYM 10t/ha + 33% extra plant stand and fertilizer + Z_nSO_4 20 kg/ha improved the grain yield of paddy over the recommended fertilizer schedule and plant population.

4. RIC-03-03-18/92 PTB(9) ICAR Co-ord.

Rice varieties for late planted kharif situations (AICRIP).

The study revealed that delay in planting rice after July 20 during kharif season led to considerable decline in grain yield. IET 9757 was found to suffer least yield reduction due to delayed planting.

5. Studies on phosphorus fertilizer saving techniques for irrigated transplanted rice (AICRIP)

This is a new trial to be initiated during Kharif 1993. The objective of the experiment is to develop suitable methods of application of water soluble P sources and to assess the feasibility of meeting the P requirement with partially soluble P sources.

6. Evaluation of partially acidulated phosphate rock in wet land rice (AICRIP)

It is aimed to evaluate the efficiency of partially acidulated mussorie phosphate rock as a source of P in wet land rice and the experiment is to be started during Kharif 1993.

7. Management of iron toxicity for increased rice productivity (AICRIP)

This is a new experiment to be initiated during the current year. Formulation of measures for improving rice yields in iron toxic soils through judicious combination of chemical amendments, nutrient application and varietal choice is the main objective of the study.

8. RIC-10-00-07-PTB-1-91-ICAR Co-ord.

Weed control trial for direct sown rice under puddled condition.

The experiment was started during 1991-92 to find out efficient methods of weed control in direct seeded rice under puddled condition. The results showed that pendimethalin and Butachlor @ 1.5 kg ai/ha can be successfully used for controlling weeds in wet sown rice.

9. RIC-09-02-03-Ptb-1-89 ICAR Co-ord.

Effect of prilled coated and large granule urea on yield of rice under puddled condition.

Experiment was started during 1991-92 to study the efficiency of different forms of urea under puddled situation and its time of application.

10. RIC-08-00-07/Ptb-3-89-ICAR Co-ord.

Soil fertility management of acid soils for upland rice.

Experiment was started during 1992-93 with the objective to monitor fertility changes and soil characteristics under upland condition when different nutrients are applied continuously and to estimate the long term effects on yield response and to study the performance of upland rice in a rice based cropping pattern involving legums.

11. RIC-09-Ptb-1-89 KAU N.P.

Growing leguminous crop as a source of green manure in dry sown rice.

With the objective to find out the possibility of growing cowpea and sunhemp as intercrops in dry sown rice to meet the green manure requirement of the crop. The results showed that among the green manure crops tested cowpea can be successfully raised as an intercrop in dry sown rice to meet the green manure requirement without affecting the yield of rice.

12. BR-01-00-13 PTB-3-61 KAU Non Plan

Permanent Manurial Experiment (Tall indica)

Permanent Manurial Experiment with tall indica series was started in 1961 with an objective to study the effect of continuous application of cattle manure, green leaves and ammonium sulphate individually and in combination with and without P and K.

The trend of result suggest that the productivity of traditional tall indica series on long term basis shall be maintained only under conditions of organic manuring especially with cattle manure.

13. BR-01-00-11 PTB-3-73 KAU Non Plan

Permanent Manurial Experiment (Dwarf indica series)

This experiment with dwarf indica series was started in 1973 with an objective to study the effect of continuous application of cattle manure, green leaves and ammonium sulphate individually and in combination with and without P and K.

The trend of result suggest that the productivity level of dwarf indica genotype at substantial level can be maintained in the rice monoculture system only through application of larger levels of organic manures to the tune of 50% of total N schedule.

14. BR-01-00-31-PTB-3-91 KAU Non Plan

Fertilizer requirements of different yield targets of paddy based on soil test values in low land acid laterite

The experiment is designed to determine optimum fertilizer requirement for maximum yield, economic yield and also for different yield targets based on soil test values.

15. BR-01-00-30 PTB-3-91-KAU

Transformations and losses of N under different periods of N application to rice in submerged low land acid laterite soil.

The main objective of the experiment is to determine the optimum time of N application for better N utilization and to find out the leaching volatilization losses of N under different periods of N application.

The experiment was initiated only during this kharif season.

NEW PROJECTS SUBMITTED TO P.C. GROUP FOR APPROVAL

1. NPK requirements of the newly released rice varieties/ cultures from RARS, Pattambi.

The objective of the experiment is to find out the optimum dose of fertilizers for the newly released varieties/ cultures from RARS, Pattambi; and also to find out the economic optimum dose of fertilizers in the rice monoculture system.

2. Response of rice to secondary nutrients.

To objective is to assess the response of secondary nutrients viz. Calcium, magnesium, sulphur and silicon on rice; dynamics of the secondary nutrients under submerged low land laterite soil; and to study the uptake pattern of these nutrients by rice.

CROP PROTECTION

Pathology

1. RIC-03-02-02-PTB (5)-89 ICAR Co-ord.

   a) Screening for blast resistance.

   The reaction of 188 NSN-I entries 485 NSN-II entries 96 MRSN entries and 30 KAU entries against leaf blast are tested in this trial.

   b) IRBN-Supplement 1993

   In this INGER trial 16 entries are tested to find out the partial resistance to blast and 75 entries to leaf blast.

2. RIC-03-02-01-PTB (5) 89 ICAR Co-ord.

   Screening for sheath blight resistance

   799 entries comprising NSN-I, NSN-II, MRSN and KAU cultures will be tested against sheath blight resistance.

3. RIC-12-02-05-PTB (5) 89 ICAR Co-ord.:

   New fungicidal evaluation trial for blast disease control EC/WP formulations.

   To test the efficacy of new fungicidal formulations against blast disease 10 chemicals are being tested in this trial.

4. RIC-12-02-08-PTB (5) 89 ICAR Co-ord.

   Evaluation of new fungicidal formulations for sheath blight control.

   To test the efficacy of new fungicidal formulations in controlling sheath blight disease 9 chemicals are tested in this trial.

5. RIC-12-01-01/88 PTB(5) ICAR Co-ord.

   Disease management trial.

   In this trial efficiency of disease management in relation to resistant and suseptible varieties to blast and sheath blight are tested.

6. RIC-13-00-05/91 PTB(5) ICAR Co-ord.

   Disease observation Nursery.

   The objective of the trial is to observe the time of occurance of incidence and intensity of diseases in a given location adopting three sowings i.e. (1) at optimum time (2) prior (3) later to optimum time.

Entomology

1. RIC-03-01-01/69 PTB (4) ICAR Co-ord.

a) Gall midge screening trial.

b) Gall midge biotype studies.

Under gall midge screening trial, 70 entries will be evaluated for resistance to gallmidge and resistant entries selected.

The gall midge biotype studies will be taken up as a part of GMS from this year onwards to identify the biotype of gall midge existing at Pattambi as the existence of Vth biotype is suspected from the observations in earlier studies.

2. RIC-12-03-06/90 PTB (4) ICAR Co-ord.

Insecticide evaluation trial:-

The objective of this study is to test the efficacy of promising insecticides at lower dosages and new insecticides at higher dosage against major insect pests.

3. RIC-12-03-01/89 PTB (4) ICAR Co-ord.

Trial on early stage pest control.

This trial is taken up to study the effect of insecticide application in the nursery on insect pest incidence in the main field in early stages of transplanted crop.

4. RIC-02-02-06/90 PTB (4) ICAR Co-ord.

Multiple Resistance Screening Trial.

During the year 97 entries received from Plant Breeding Section of this station willbe evaluated to note the reaction against insect pests with a view to identify multiple resistant varieties.

5. RIC-02-02-07/90 PTB (4) ICAR Co-ord.

National Screening Nursery.

The reaction of 188 advanced/initial yield trial entries received from DRR, Hyderabad willbe assessed during the year against major insect pests.

6. PP-08-00-01/69 PTB (4) KAU N.P:

a) Light trap data collection.

b) Monitoring of insect pests through pheromone traps.

The light trap data collection is done to monitor the rice pest population in the field to adjust time of insecticide application and to detect the fluctuations of insect pest populations over a period of time.

Monitoring through pheromone traps will be done to supplement the light trap collections and to compare the effectiveness of light trap and pheromone trap in the case of stem borer/leaf folder.

STAFF POSITION

Scientific

KAU Non Plan

Sl. No.	Category	Discipline	No.of posts sanctioned	In position	Remarks
1	Associate Professor (2)	Botany	1	-	
	-do-	Chemistry	1	-	
2	Asst. Professor (2)	Plant Pathology	1	1	Res. Assoc. working against the post
3	Jr. Asst. Prof. (4)		4	-	
NARP Phase-I (KAU Non Plan)					
1	Professor (2)	Pl. Breeding	1	1	Prof. (Pl.Path.) working against the post.
	-do-	Soil Science	1	1	Assoc. Prof. working.
2	Assoc. Prof. (3)	Agronomy	2	-	
	-do-	Engg.	1	-	
	-do-	Economics	1	-	
3	Asst. Professor(10)	Agro.	1	-	
		Soil Science	2	2 -	1 Post Assoc.Prof. 1 Res. Associate
		Economics	1	-	
		Extension	1	1	
		Horti.	1	1	Vacant from 1.7.93
		Bio chemistry	1	-	
		Entomology	1	1	Assoc. Prof. against the post
		Pl. Breeding	1	1	Res. Associate.
		Agrl. Engg.	1	-	
NARP Phase-II (KAU Non-Plan w.e.f. 30.4.92)					
	Assistant Professor (3)	Horticulture	1	1	J A P
		Agrl. Engg.	1	-	
		Animal Science	1	-	

contd...