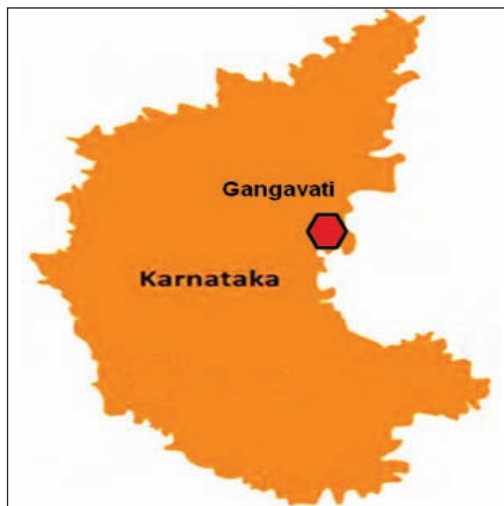


GANGAVATI

Agricultural Research Station
University of Agricultural Sciences, Raichur
Karnataka

Agricultural Research Station Gangavathi was established in the year 1956. All India Co-ordinated Rice Improvement Programme was established in the year 1976 at Agricultural Research Station Siruguppa under University of Agricultural Sciences, Bangalore. Later on it came under the University of Agricultural Sciences, Dharwad in the year 1986. Presently it is under the Jurisdiction of University of Agricultural Sciences, Raichur from 2009 onwards.



Major contributions to AICRIP

Crop Improvement - Plant Breeding

- Released CSR-22, a high yielding, long slender, salt tolerant variety during 2008-09 which has spread in an area of about 1000 ha.
- Released IET-20594(GGV-0-01), a dual season, biotic (blight and blast) and abiotic (salinity) stress tolerant variety possessing genetic yield potential of 10.85 t/ha. From 2007-08 it has spread in area of about 35000ha.
- Nominated 7 varieties to AICRP coordinated trials *viz.*, GGV-05-01, GGV-05-02, GVSAT-05-01, GGV-05-01-1, GGV-05-02-1, GNV-11-01 and GNV-11-02.
- Identified 7 promising genotypes with different grain size and duration for irrigated ecology of northern Karnataka which will be promoted and released in the coming years. These are IET-19251, IET-19828, IET-22076, IET-21575, IET-18299, IET-22096 and IET-22147.
- Handling 30 advanced lines and 350 F4-F5 families and 400 M2 plants which will be further studied. Of these, 30 promising cultures were studied through molecular diversity.
- Collected and characterized morphologically 40 desi/land races to diversify research genetic base.

Popular varieties developed and released

GGV-05-01(Gangavati sona)

Selection from MTU-1076 population. Suitable for both kharif and summer sowing in Tunga Bhadra project area. Recommended both for normal and salinity affected soils, as it with stands salinity levels up to 6.5-8.5ds/m. Average yield is 5966kg/ha, about 15 % higher grain yield over BPT-5204 during kharif and tolerant to sheath blight and BLB and neck blast.



CSR-22 (Salinity tolerant variety)

A promising long slender genotype CSR-22 over best check BPT-5204 is identified for saline situations in Tunga Bhadra Project area and released during 2008-09 for Zone-3 which has been notified during 2009-10 at national level. This variety is identified from NSASN trials, which was developed at CSSRI, Karnal (IET-No 13767)

SIRI-1253

It is a medium slender grain, medium tall variety, maturing about 8-10 days early to check BPT-5204. It yields 17.0 % higher grain yield over BPT-5204. It is released in the year 2013-14 from UAS, Raichur.



Crop production

Agronomy

Nutrient management

- Application of 200:100:100:20 kg N,P₂O₅, K₂O & ZnSO₄/ha found optimum for getting higher grain yield in transplanted rice.
- Leaf colour chart No 5 (7 Panel LCC) based nitrogen scheduling was found an appropriate agronomic practice for transplanted rice and drum seeded rice with the added advantage of saving N to an extent of 30% besides higher grain yield.

- The nitrogen scheduling for direct seeded rice revealed that application of 150:60:50 kg N,P₂O₅& K₂O/ha with 1/3 N each at the time of sowing, active tillering and panicle initiation stages recorded significantly higher grain yield.

Weed Management

- In transplanted rice pre-emergence application of Anilofos 30 EC @ 1500 ml/ha 5-7 Days after transplanting gave effective weed control. Similarly pre-emergence application of Bensulfuron methyl plus pretilachlor 6.6% G 5-6 DAT was found effective in controlling diverse weed flora in transplanted rice.
- Pre-emergence application of Pendimethalin 30 EC @ 0.75 kg ai/ha along with dhaincha incorporation at 30 days and one hand weeding at 60 DAS is an effective weed management strategy for aerobic rice. Similarly, pre-emergence application of Butachlor 50EC @1.5kg a.i/ha at 3-4 DAS followed by Bispyribac sodium 10% SC @ 35 g.a.i/ha at 15-20 DAS was effective against all types of weeds including sedges, grasses and broadleaf weeds.
- Post emergence application of Penoxsulam 24% SC at 2-4 leaf stage proved effective in controlling weeds in direct seeded rice under puddled conditions.

Cultural practices

- The agronomic practices for drum seeder rice revealed that drum seeding of sprouted seeds on puddled soil at the rate of 40 kg/ha (30 cm line spacing) during the month of July is an alternative method of establishing rice to transplanting in Tungabadra command area.
- Screening of rice genotypes for aerobic conditions revealed that the genotypes GGV-05-01, MAS-26 and Siri 1276 performed better under aerobic conditions than other genotypes.



Mechanization in rice

- Studies on mechanization in transplanted rice revealed that transplanting by a six row mechanical rice transplanter at a line spacing of 30 x 15 cm recorded 9.0% higher grain yield than traditional random transplanting. The increased grain yields were mainly attributed to pro-fused tillering and better grain filling.



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- Standardization of mat nursery techniques revealed that a potting mixture of black soil and vermin-compost (80:20) or black soil and sieved FYM (60:40) is ideal for raising mat nursery and resulted in better establishment of seedlings without gaps.

System of Rice Intensification

- Water requirement of rice in case of SRI was about 1110 mm compared to 1745 mm in traditional method resulting in 36.3% saving of water.
- In SRI, ten days aged seedlings proved superior than 15 days aged seedlings with yield advantage of 5.2%. Pre-emergence application of Anilofos @ 0.6 kg ai/ ha with one hand weeding at 40 DAT or two cono-weedings followed by one hand weeding at 40 DAT is an effective weed management strategy under SRI.

Organic farming

- The net work project revealed that the INM treatment of 50% organics and 50% inorganics recorded significantly higher grain yields in 6 years out of 9 years of experimentation.
- The performance of 100% organics as compared with that of inorganics alone (which is the prevailing practice) indicated that around three years of continuous application of 100% organics is required to attain grain yield levels on par with that of inorganics alone.
- Economic analysis indicated that it takes about four years of continuous application of 100% organics to realize net returns and BCR that are on par with recommended practice of applying 150:75:75 kg, N, P₂O₅ and K₂O/ha along with 10 t/ha of FYM. Further the gross and net returns and BCR in case of 75% organics and 100% organics remained on par from fourth year onwards. The higher gross & net returns and BCR in case of 100 and 75% organics were attributed to premium price of the produce and improved yields.

Precision farming studies in rice

- Precision farming in rice was undertaken on an area of 38.75 ha at Jangamara kalgudi village near Gangavathi, koppal Dist, Karnataka. Grid wise soil analysis indicated large amounts of residual soil P and K. STCR approach is followed for fertilizer recommendation and was found that fertilizers dose of 210 kg N, 24 kg P₂O₅ and 32 kg K₂O/ha was sufficient to realize 85% of the target yield resulting in savings of 37%N, 82% of P₂O₅ and 68% in K₂O.

Crop protection

Entomology

- Insecticides and acaricides were evaluated regularly against major pests for the region and recommendations were given:
 - ♦ Imidacloprid 17.8 SL, thiamethoxam 25 WG and Buprofezin 25 SC, sulfoxaflor @ 375 ml/ha are recommended against hoppers.
 - ♦ Flubendamide 36% + Fipronil 30%, Buprofezin + acephate and Acephate 95 SG, Buprofezin+ acephate (RIL049/F1) are found effective against major insect pests of rice
 - ♦ Mites are effectively managed by application of Abamectin 5 EC.
 - ♦ Flubendamide and spinosad showed good compatibility with fungicide Isoprothiolane. Ethiprole + imidacloprid is compatible with standard fungicides like hexaconazole and tricyclazole. Dinotefuran 20 SG showed compatibility with standard fungicides like hexaconazole and tricyclazole. RIL 049 was compatible with standard fungicide like tricyclazole and hexaconazole. Flubendiamide 4%+ Buprofezin 25 SC was compatible with standard fungicide.
- Ecological engineering is encouraging for increasing activity of natural enemies and suppressing the hoppers activity.
- For the organic paddy growers application of vermicompost or green manure+ 50% RDN was found superior in reducing pest incidence and recording higher yield
- Egg parasitisation of hoppers was 16.35%, with Anagrus, Oligosita and Gonatocerus accounting for 10.58, 4.49 and 1.28 per cent, respectively. Anagrus was dominant parasitoid accounting for 64.72 per cent followed by Oligosita (27.46%) and Gonatocerus (17.84%).

Plant pathology

- Screening germplasm for resistance against leaf blast, neck blast, sheath blight, BLB, *etc.*- TNRH-173, IR64 and VOHP3102 showed low susceptible index of 0 and highest 5 by VL30921 and CB06555 against leaf blast. Among all the entries tested, high promising index of 0 was showed by TNRH17 and Swarnadhan followed by index of 1 by MGDGP-1, TNRH180, Benibhog, TNRH174, TNRH185, Vikramarya, VL31320 and TN1. A high susceptible index of 5 was noticed in CB06541 against sheath blight.
- Testing new fungicides/bactericides for their efficacy in controlling diseases and formulating effective dosage, frequency and time of application - Among the different treatments imposed, the test fungicide Metaminostrobin 20EC @

200gm ai/ ha was found significantly effective in checking the leaf blast and neck blast severity with the disease incidence of 12.2% and 30.8%, respectively compared to 51.7% and 43.4% in check. Trifloxystrobin 25% + Tebuconazole 50% (Nativo 75 WG) @ 0.4 gm/lit reduced the severity of blast and sheath blight with increased yield (8750 kg/ha) compared to check. (3062 kg/ha).

- Epidemiological study for newly emerging diseases such as false smut, stem rot and grain discoloration - on the second sown crop, KRH-2, DRRH-3, and US-312 found with highest percentage of infected smut balls/sq.m
- Development and evaluation of integrated disease management strategies to combat multiple disease and pest.