

MUGAD

Agricultural Research Station, UAS, Dharwad Karnataka

Work on the improvement of the rice in Malnad region was taken up in the year 1923, when the Agricultural Research Station was established at Mugad, which is a true representative of the tract.



Major contributions to AICRIP

Crop Improvement

- ARS, Mugad played an instrumental role in testing and release of important varieties like Jaya, Intan, Prakash.
- After inception of AICRIP, several promising entries viz., Avinash (Gama-318) for midland, Abhilash (IET-5882) for lowland were released in 1985.
- Abhilash variety has been quite popular in farmers' fields in Dharwad and Uttara kannada districts.
- Amruth (IET-7991) and Prasanna (IET-7564) were released during 1993 and 1994, respectively. Among these, Amruth has been found promising and popular for drill sown upland conditions of Karnataka.

Table 1: Paddy cultivars released for rainfed cultivation from ARS, Mugad

Cultivar	Year of release	Duration (days)	Target Ecology	Yield (t/ha)	Relevant Features
A 67	1931	140-145	Upland	2.7 - 3.0	Blast resistance
M 161	1931	140-145	Upland	2.7 - 2.8	--
A 90	1931	150-160	Midland	2.7 - 2.8	Blast resistance
M 81	1931	155-160	Midland	2.7 - 2.8	Blast resistance
M 249	1931	150-165	Midland	2.7 - 2.8	Blast resistance
A 200	1931	160-170	Lowland	2.8 - 3.0	--
M 141	1931	160-170	Lowland	2.8 - 3.0	--
WANAR 1	1945	130-135	Upland	1.3 - 1.5	VE, Blast & Drought resistant
D 6-2-2	1945	130-135	Upland	2.0 - 2.2	VE & Drought resistant
K 44-1	1945	160-165	Midland	2.7 - 2.8	Medium-fine & scented
Y 4	1945	160-170	Lowland	3.3 - 3.6	Fine & high yielding

HY 256(p)	1960	160-165	Midland	2.2 – 2.5	Purple cultivar
HY 258-1	1960	170-175	Midland	2.5 – 2.8	Fine and scented
HY 246-13-1	1960	170-175	Midland	2.5 – 2.8	Very fine & scented
HY 449-17	1960	180-185	Lowland	2.8 - 3.3	Medium fine
HY 26-10	1960	180-185	Lowland	2.8 - 3.3	Medium fine & Blast tolerant
AVINASH	1985	140-145	Midland	3.8 – 4.0	Pest & Disease resistant
ABHILASH	1985	155-160	Lowland	4.2 – 4.5	Pest & Disease resistant
AMRUTH	1993	105-110	Upland	3.5 – 3.6	Early & Drought tolerant
PRASANNA	1994	95-100	Upland	3.0 – 3.2	VE, Drought & Blast tolerant
MUGAD SUGANDHA	2001	130-135	Midland	3.2 – 3.5	Basmati quality
VIJETHA	2002	130-135	Midland	4.5 – 4.8	High yielding
MGD-101	2008	125-130	Upland	3.5 - 4.0	High yielding and drought tolerant
Mugad SIRI-1253	2010	135-140	Midland	4.5 – 5.0	High yielding and fine grained (MS); good quality
PSB-68	pipeline	140-145	Lowland	4.5 – 5.0	High yielding suitable for puffing and flaking

Mugad Sugandha (IET-13549)

Parentage: Selection from Basmati RP-ST-328

Duration: 130-135 days

Grain yield: 32-35 q/ ha

Grain type: long slender

Special features: Dwarf (65 cm), moderately resistant to blast, moderately tolerant to LR



MGD-101 (IET-19554)

Duration: 125-130 days

Grain type: medium bold

Grain yield: 38-45 q/ ha

Special features: Identified as superior drought tolerant as well as high yielding genotype for rainfed uplands.

Asha (IET 9926) has been released during 2010 for cultivation under shallow land situation of Karnataka State.

IET-22704 (MGD-1104) is found promising in the states of Punjab, Odissa, Bihar, Chhattisgad, Jharkhand and Tamil Nadu under aerobic condition.

IET-21839 (MGD-109) pure line selection from Kumud a land race is promoted from IVT-ASG during kharif 2012.

Mugad SIRI-1253 (IET-19803)

Duration: 135-140 days

Grain type: medium slender

Yield: 45-48 q/ ha

Special features: high yielding, moderate blast resistance and good cooking quality



Crop Production

Agronomy

- The seed rate of 65-80 kg/ha with 20 cm row spacing has been found to be optimum for drilled paddy.
- A fertilizer level of 100-50-50 kg N-P₂O₅-K₂O with 12 cart loads of farm yard manure per hectare are found to be optimum for drilled paddy cultivation.
- Application of 33% extra seeds and 33% extra NPK fertilizers, alone or in combination with 10 t FYM and 20 kg ZnSO₄/ha was found to increase grain yield and net profit considerably, compared to the normal practice in lowlands.
- Split application of N @ 33.3% of the total recommended N, each at 20 and 40 days after seeding and at panicle initiation gave higher yield with better weed management in comparison with earlier recommended practice of 50% as basal and remaining 50% as top dress in drill seeded rice.
- Application of Urea coated with Nimin @ 75 kg N/ha gave higher yield compared to prilled urea at 100 kg N/ha.
- Application of P through Rock-phosphate + DAP (50:50) yielded higher in rainfed drill sown as well as transplanted rice.
- Rice yields were higher when K was applied in three splits of 50% basal, 25% at 25-30 days after planting and 25% at 50-55 days after planting.
- Spraying weedicide Butachlor @ 1.5 kg/ha or Pendimethalin 30 EC @ 3.3 L/ha or Aniloguard 30 EC @ 300 g ai/ha at 3-5 days of seeding combined with hand weeding at 30 days after seeding controls weeds effectively and economically in rainfed drill seeded rice.

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- Wet seeding of sprouted paddy seeds @ 40 kg/ha with eight row drum seeder was found better alternative in place of transplanting under lowland conditions.
 - Mixing of Sun hemp seeds @ 15 kg/ha with paddy seeds at the time of sowing, followed by incorporation at 40 days after sowing helps in improving the soil fertility besides sustained paddy yields.
 - Nitrogen management through leaf colour chart saved the fertilizer besides sustained yields. Leaf colour chart reading of 3 for Intan and 4 for Abhilash under lowland condition was found to be optimum and also reduced the blast incidence.

Crop Protection

Plant Pathology

- Major diseases noticed under rainfed ecosystem region are blast and brown spot whereas bacterial leaf blight, sheath blight and blast appear in severe form in command areas. Other diseases like Udabatta, false smut, leaf scald, rice tungro virus (RTV), grain discolouration and sheath rot appear in moderately severe form depending upon the climatic conditions.
- Seed treatment with carbendazim @ 2 g / kg seed and spraying of Carbendazim (@ 2 g / lit) or Tricyclazole @ 0.06% thrice; First spraying to be given soon after the disease appearance then 20 days later and third spray at panicle initiation stage controls both leaf and neck blast.
- Seed treatment with *Pseudomonas fluorescens* @ 8 g /kg seed + 2 sprays of Nimbicidine @ 5 ml / l water was effective against leaf and neck blast.
- The pathogen *Pyricularia grisea* exhibits a great genetic variability which is evident by the prevalence of IA, IB and IC race groups of the pathogen in Northern Karnataka. Among the different blast resistant genes (Pi- genes) screened, Pi-1, Pi-2, Pi-1 + Pi-2 and Pi-9 showed resistance reaction across the North Karnataka.
- Resistance sources identified for blast disease are: VSR-8, Vajram, Tetep, Casebatta, Vdarsali.
- Spraying of Carbendazim or Ediphenphos 1 g/l twice at flowering stage is effective for the control of brown spot. Resistant varieties for brown spot are Prasanna, Abhilash, Amruth and Vijetha.
- For control of Sheath blight, spraying of Hexaconazole @ 2 ml/lit or Validamycin @ 1.5 ml/l was effective.
- Management of Bacterial leaf blight- seed treatment with streptomycin @ 0.1 g and Copper Oxychloride @ 0.1 g/kg seed or soak the seeds in the solution of Agrimycin-100 @ 0.1 g and Copper oxychloride @ 0.1 g/l for 20 minutes before sowing.