

RANCHI

Birsa Agricultural University Jharkhand

AICRIP at Kanke under Birsa Agricultural University, Ranchi, Jharkhand was started in the year 1981. The soil and climate of the state are very much favourable for hybrid rice cultivation and hybrid rice along with SRI has been able to provide good yield of rice in the farmers' field. This center is associated with the development of Sahbhagidhan with 115-120 days duration and yield potential of 40-50 q ha⁻¹.



Major Achievements

Crop Improvement

Varieties released/ identified:

S. No	Variety	Characters
1	Birsa Dhan-101	Tolerant to blast, BLB, stem borer and drought. Suitable for rainfed upland ecosystem. Matures in 80-85 days, yield potential 8-10 q/acre.
2	Birsa Gora-102	Red rice, resistant to drought but susceptible to Brown spot, Gundhi bug & Stem borer. Matures in 90-95 days, yield potential 7.0 to 7.5 q/acre.
3	Birsa Dhan-103	Tolerant to brown spot, blast, BLB, Stem borer and Gall midge. Suitable for rainfed upland ecosystem. 95-110 days duration, yield potential 12 to 14 q/acre.

S. No	Variety	Characters
4	Birsa Dhan-104	Long and bold seed. Tolerant to blast, BLB, Stem borer, BPH and Gall midge. Suitable for rainfed upland ecosystem. Matures in 85-90 days, 8 to 10 q/acre yield.
5	Birsa Dhan-105	Tolerant to blast, BLB, Stem borer and Gall midge. Suitable for rainfed upland ecosystem. Matures in 85-90 days, yield potential 10 to 12 q/acre.
6	Birsa Dhan-106	Tolerant to blast, BLB and Stem borer. Matures in 90-95 days, yield potential 10 to 12 q/acre.
7	Birsa Dhan-107	Tolerant to Brown spot, blast, BLB, Gall midge and Stem borer. Suitable for rainfed upland ecosystem. Matures in 90-95 days, yield potential 10 to 12 q/acre.
8	Birsa Dhan-108	Tolerant to blast, BLB and stem borer. Early maturing variety. 70-75 days duration, 10 to 12 q/acre yield.
9	Birsa Vikash Dhan-109	Superfine and long slender grain. Tolerant to blast, BLB Stem borer, and drought. Matures in 85 days with yield potential of 10 to 12 q/acre.
10	Birsa Vikash Dhan-110	Superfine and long slender grain. Tolerant to blast, BLB, stem borer and drought. Suitable for rainfed upland ecosystem. Matures in 95 days with yield potential of 10 to 12 q/acre.
11	Birsa Vikash Dhan-111	Deeply rooted having medium tall plant (Plant height- 84-95 cm). It has weed smothering capabilities and also superfine and long slender grain (L- 9.3 mm, Breadth- 2.4 mm). Tolerant to blast, BLB, Stem borer and drought. It matures in 85 days, yield potential 9 to 10 q/acre.
12	Rajendra Dhan-202	Semi dwarf with compact and long panicle, straw coloured hull and long bold grain with white kernel. Resistant to blast, BLB and drought. Matures in 120-125 days with yield potential of 16 to 18 q/acre.
13	Birsa Dhan -201	Long, bold with white kernel. Suitable for medium land. Resistant to blast, brown spot and Gundhi bug. Matures in 115-120 days, yield potential 14 to 16 q/acre.
14	Birsa Dhan -202	Long, bold with white kernel. Suitable for medium land. Resistant to blast, brown spot and Gundhi bug. Matures in 120-125 days and has yield potential 16 to 18 q/acre.
15	Birsamati	Long slender grain with good aroma. Suitable for rainfed medium low land. Resistant to all major pests and diseases. Matures in 130-135 days, yield potential 16 to 20 q/acre.
16	Lalat	Long, bold with white kernel. Suitable for medium land. Resistant to Gall midge & moderately resistant to blast, BLB, false smut, stem borer, Gundhi bug. Matures in 120-125 days and has yield potential 18 to 20 q/acre.

S. No	Variety	Characters
17	Birsa Vikash Sugandha -1	Long slender grain with 3.71 mm L:B ratio and aromatic. Moderately resistant to blast, BLB, Brown spot, stem borer and gundhi bug. It matures in 120-125 days and has yield potential of 16 to 18 q/acre.
18	Birsa Vikash Dhan -203	It may be cultivated in transplanted in drought prone medium land of Jharkhand. Long slender grain, non lodging, semi dwarf plant type. Moderately resistant to blast, BLB, Brown spot, stem borer and gundhi bug. Matures in 120-125 days, yield potential 16 to 18 q/acre.

Crop Production

Agronomy

- System of Rice intensification (SRI) has become very popular in all the districts of Jharkhand because, following 2-3 components of SRI, farmers are harvesting 15-20 % more grain yield in comparison to conventional method of transplanting of rice. Considering the importance of SRI the BAU centre Ranchi has also conducted a number of experiments on SRI after following all the components or even only one component also. Therefore university is likely to release a technology of SRI after considering the significance of each and every components of SRI that technology may be recommended/released for the farmers of Jharkhand.
- In rainfed medium and low land situation of Jharkhand, sedges weeds *i.e.* *Cyperus* spp. and broad leaves weeds are prevalent and it is very difficult for controlling them by manual weeding in rice. It was found that sedges and broad leaves weeds reduce the grain yield of rice up to 30-70%. Carfentrazone (a herbicide) @ 25g a.i./ha was found most suitable in controlling sedges as well as broad leaves weeds.
- In Jharkhand, there are three agro-ecological situations *i.e.* upland, medium and low land rainfed. The rainfed upland is highly acidic (<4.5), with low organic carbon (<0.33%), low in K and also very low in rice productivity (8-10 q/ha). Hence a trial of amelioration of acidic soils for enhancing the rice productivity was conducted at Ranchi centre and found out that the application of RFD+FYM+LIME+100% extra K increased grain yield upto 20 q/ha.
- Based on station trials followed by validation trials on farmers' field, technologies were developed to enhance the productivity and profitability of

rained upland rice, aerobic rice, hybrid rice and organic rice.

- Integrated Crop Management (ICM) resulted in 15% more yield as compared to System of Rice Intensification (SRI) in irrigated medium land situation.
- Crop like urd bean, soybean and pigeon pea were identified as suitable inter crop with rainfed upland rice.

Crop protection

Entomology

- During 1980's based on field trials conducted at Ranchi centre, gall midge (*Orseolia oryzae* w.m.) got the separate identity as the *gall midge bio-type-3*. The variety *Rajendra Dhan-202 (RD-202)* was developed by the Ranchi centre as *resistant to the gall midge biotype-3* during 1980's. Based on regular survey and surveillance, Simdega, Gumla, Lohardaga, Khunti and some pockets of Ranchi districts of Jharkhand were identified as endemic areas to rice gall midge biotype-3.
- Rice varieties *viz.* Kavya, Naveen Lalat and IR-36 proved to be resistant against gall midge (biotype-3) with <10% silver shoots. Sahbhagi and Abhishek exhibited moderate resistance to gall midge. Thitpiti, INRC 202, MR1523, RP-2068-18-3-5, INRC 1997, INRC 3021, Aganni, ARC 6605 and Abhaya remained almost free from the attack of gall midge biotype - 3
- Saket-4, Deepti, Ratna and SashyaShree varieties were identified as resistant against yellow stem borer.
- Application of carbofuran 3G @ 30 kg /ha, phorate 10G @ 10 kg/ha or cartap hydro-chloride 4G @ 25 kg/ ha at 15-20 days after transplanting (DAT) proved to be effective against gall midge, yellow stem borer, GLH, BPH and moderately effective against hispa and leaf folder.
- Seedling root dip of rice in water solution of chlorpyrifos 0.02 percent proved to be highly effective against gall midge and yellow stem borer.
- Combination product, flubendamide 36% + fipronil 30%, 66 WG @ 50 g/ha applied on need basis as foliar spray was found effective against gall midge, yellow stem borer, GLH, leaf folder and hispa followed by another combination product, Imidacloprid 40% + ethiprole 40%, 80 WG @ 125 g/ha.

- Foliar spraying of the combination product RIL-IS-109, flubendamide 4%+ buprofezin 20 %, @ 875 ml/ha or acephate 75 SP @ 800 g/ha or Acephate 95 % SG @ 592 g/ha were highly effective against gall midge, YSB, leaf folder, hispa and GLH.
- Catap hydrochloride 50 SP @ 1300 g/ha proved to be the most effective against gall midge, yellow stem borer, and gundhi bug and gave grains yield of 47.1 q/ha. Sulfoxaflor (24%) @ 375 g/ha belonging to the new group sulfoximine was highly effective against GLH and gall midge. The improved molecule of triazophos 40 EC @ 1250 ml/ha reduced significantly the pests like gall midge, YSB, leaf folder, hispa, GLH and gundhi bug, realizing substantially higher yield (47.0 q/ha).
- Broad casting / application of carbofuran 3G @ 33 Kg/ha or phorate 10G @10 kg/ha in the nursery bed, followed by application in the main field could be responsible for significant management of rice root gall nematode.
- Tank mix application of Acephate 95 SG plus hexaconazole 5SC @ 1.2 g + 2.0 ml per lit water and acephate 95 SG plus tricyclazole 75 SP @ 1.2 g + 0.6 ml per lit of water proved highly effective and compatible in reducing the incidence of major insect pests i.e. YSB, hispa, GLH, gall midge, leaf folder along with leaf blast and brown spot diseases. Dinotefuran 20 SG plus either hexaconazole or tricyclazole was found compatible and effective against major pests and diseases of rice. None of the pesticide combinations were found phytotoxic to the rice plants.
- Incidence of GLH, gall midge and hispa was significantly higher in the normally transplanted system as compared to the direct wet seeded rice, whereas the leaf folder incidence was higher in the direct wet seeded rice. Incidence of stem borer did not differ significantly between the two cultivation systems.
- Participatory IPM trial conducted in farmers fields revealed that IPM operations and timely application of insecticides reduced the crop damage due to GLH, GM, YSB, and leaf folder in IPM blocks resulting in higher grain yield and BC ratio as compared to farmers practices.