

RAIPUR

Rice Research Station

Indira Gandhi Krishi Vishwavidyalaya, Raipur Chhattisgarh

In the British regime one agricultural research station was established in 1903 known as “Labhandi Farm”. This Labhandi Farm later became the campus of Indira Gandhi Krishi Vishwavidyalaya, Raipur. Rice Research Station (RRS) was started in 1968. Later in 1974 Madhya Pradesh Rice Research Institute (MPRRI) was established under the leadership of great rice scientist Dr. R. H. Richharia. Indira Gandhi Krishi Vishwavidyalaya, Raipur was started on January 20, 1987 after bifurcation from Jawaharlal Nehru Agricultural University, Jabalpur.



Major contributions to AICRIP

Crop Improvement

Plant Breeding

- High yielding dwarf varieties released from Raipur centre during 1975 to 1993 include Pragati, Kranti, Tripti, Abha, Deepti, Asha, Usha, Samridhi and Madhuri. From 1987 to 2014, sixteen rice varieties were released and one identified in 2014. Rice genotypes like Dagaddeshi, Bakal, Assam Chudi were identified as new donors for drought tolerance.
- A total of 23250 germplasm collection of rice accessions are being maintained and evaluated for various biotic and abiotic stresses along with yield contributing traits.
- Based on evaluation dataset, Catalogue on Indigenous Rice Germplasm has published in two parts, Part -1 has 5096 accessions (Indigenous Rice Germplasm of Chhattisgarh and Madhya Pradesh and Part -2 has 7599 accessions (Indigenous Rice Germplasm of Chhattisgarh and Madhya Pradesh), both parts characterized for 23 qualitative and 12 quantitative characters.

- A total of 9860 rice lines from CG Gene bank of IGKV, Raipur representing different collection sites mainly the Chhattisgarh and adjoining part of MP and advanced breeding lines have been analyzed for four nutritional quality traits; total protein, lysine, iron and zinc contents.

List of varieties released from IGKV, Raipur

| S. No. | VARIETY | IET NO. | NOTIFICATION NUMBER |
|--------|-------------------------|-----------|------------------------------|
| 1 | Poornima | IET 12284 | S.O. 360 (E) dt 1-5-97 |
| 2 | Mahamaya | IET 10749 | S.O. 1(E) dated 1-1-96 |
| 3 | Shyamla | IET 12561 | S.O.. 360 (E) dt 1-5-97 |
| 4 | Danteshwari | IET 15450 | S.O. 1134 (E) dt.15.11.01 |
| 5 | Indira sugandhit dhan-1 | IET 15376 | S.O. 124(E) dt.2.2.05 |
| 6 | Bamleshwari | IET 14444 | S.O. 1134 (E) dt. 15-11-01 |
| 7 | Sambleshwari | IET 17455 | S.O. 1178 (E) dt. 20-7-2007 |
| 8 | Jaldubi | IET 17153 | S.O. 1178 (E) dt. 20-7-2007 |
| 9 | Chandrasahini | IET 16800 | S.O. 1178 (E) dt. 20-7-2007 |
| 10 | Indira sona (hybrid) | IET 18872 | S.O. 1178 (E) dated 20.7.07 |
| 11 | Karma mahsuri | IET 19991 | S.O. 2458 (E) dt. 16.10.2008 |
| 12 | IGKVR-1244 | IET 19796 | S.O. 456(E) dt.: 16.3.2012 |
| 13 | Indira barani dhan-1 | IET 21205 | S.O. 456(E) dt.: 16.3.2012 |
| 14 | IGKVR 1 (Rajeshwari) | IET 19569 | S.O. 283(E) dt.: 7.2.2011 |
| 15 | IGKVR 2 (Durgeshwari) | IET 19795 | S.O. 283(E) dt.: 7.2.2011 |
| 16 | Indira aerobic 1 | IET 21686 | - awaited - |



Indira Sugandhit Dhan



Chandrasahini



Sambleshwari

- The aromatic IET **21842 (R 1536-136-1-17-1)** identified as promising for different states UttarPradesh, West Bengal, Assam and Chhattisgarh. This variety possesses high yield, short bold grain with good in quality exhibiting superior performance.
- Low genetic variations for grain Fe levels were observed compared to that of grain Zn contents. In screening of homozygous breeding lines, two rice lines

viz; **R-RF-31** and **R 1033-968-2-1** identified from the state and drought breeding trails as High Zinc rice genotypes (> 27 ppm Zn). These genotypes are currently in the pipeline of release of varieties, which will be useful in the drought prone areas of eastern Indian state including CG.

- The eight different genes for gall midge resistance has been identified namely Gm-1(Sarekha), Gm-2 (Sarekha), Gm-3 (RP 2068-18-3), Gm-4 (Abhaya), Gm-5 (RC 5984), Gm-7 (RP 2333-156), Gm-8 (Jhitpiti) and Gm-9 (Line 9). The national identity number allotted is IC 296614.

Gall - midge Resistant Genes Registered by IGKV, Raipur

| S. No. | Genes Registered for | INGR No. | National Identity | Genotype |
|--------|--------------------------------------|----------|-------------------|----------------|
| 1. | Rice gall Midge resistance gene GM-1 | 04003 | IC 296614 | Samridhi |
| 2. | Rice gall Midge resistance gene GM-2 | 04004 | IC 296614 | Surekha |
| 3. | Rice gall Midge resistance gene GM-3 | 04005 | IC 296614 | RP 2068-18-3-5 |
| 4. | Rice gall Midge resistance gene GM-4 | 04006 | IC 296614 | Abhaya |
| 5. | Rice gall Midge resistance gene GM-5 | 04007 | IC 296614 | ARC 5984 |
| 6. | Rice gall Midge resistance gene GM-6 | 04008 | IC 296614 | RP2333-156-8 |
| 7. | Rice gall Midge resistance gene GM-7 | 04009 | IC 296614 | Jhitpiti |
| 8. | Rice gall Midge resistance gene GM-8 | 04010 | IC 296614 | Line 9 |

Crop Protection

Entomology

- More than 50,000 rice entries were tested for the Raipur Gall midge and BPH resistance and near about 3000 gall midge and 300 BPH resistant entries were identified as potential donors for various International, National and State level variety development programmes. Insect resistant varieties were developed from Raipur are Asha, Usha, Samridhi, Ruchi, Abhaya Kranti, Bangoli-5, Mahamaya, Bamleswari, Danteswari Samleswari, Chandrahasni, Karmamahsuri etc.
- During the last two decades 20 new Insecticide chemical molecules, two bio and two botanical insecticides were tested and recommended against the major insect pests of rice.
- Based on long term monitoring through light trap catches for different insect pests of rice, major active period of the pest was identified. Third week of Sept. to last week of Oct is identified as the period of peak activity for most of the pests. In light trap monitoring studies the timings of 6.30 PM to 10.00 PM is identified as ideal time for operating this instrument by receiving maximum adult catches.

- In field monitoring studies, September and October months were identified as the period of peak activity for most of the insect pest. Most the natural enemies were found active in the month of September. The pest defender (P:D) ratio was found ideal i.e. 1:2 up to 20th September.
- *Platygaster oryzae* was identified as the major larval/pupal parasitoid of gall midge found active during September month. Stem borer egg masses parasitization was maximum during mid October and *Teleomus* sp was dominant species. Larval parasitization by some unidentified pathogens was ranging from 15-25% and maximum larvae were found parasitized in variety Kranti, TN-1 and Indira Sona variety of rice.
- In the last decade insect gall midge was known as the most distractive pest of rice but now stem borer, brown plant hopper, case worm and cut worm are becoming serious pests in this area
- Rice stem borer incidence has reached at the alarming situation in rice cultivation of Chhattisgarh state. Use of trap crop is found as a novel approach in eco-friendly management of this pest. To minimize the damage of yellow stem borer in the main crop (variety- swarna) by planting a trap crop (variety- Pusa basmati 1) in the ratio 9:1 was found effective and economical.
- Raipur gall midge was designated as Biotype -1, after continuous monitoring of natural population occurring during last three years it was found as the mixture of Biotype -I (95%) & Biotype-II (5%).
- Acephate found safer to *Platygaster oryzae*, the major parasitoid of gall midge.
- PM package for management of Paddy pest complex: Mahamaya, Danteswari Indira Sona, Samleswari, Chandrasahini, Jaldubi, Karmamahsuri etc variety planted up to 25th July after seedling root dip treatment by chlorpyrifos nursery treatment is an ideal practice. After that, installation of light trap which is operative during 6-10 P.M. for monitoring and mass trapping of paddy insect pests is a good practice. Installation of bamboo pegs which serve as bird perches and also help in increasing the activity of stem borer egg parasitoids. In the month of September, weekly release of *Trichogramma japonicum* is effective in increasing parasitization of stem borer egg masses. Monitoring and mass trapping of yellow stem borer through pheromone trap in the month of October is helpful in trapping the YSB adult. Need based application of Phorate 10 g 10 kg/ha or Fipronil 0.3 G 25kg/ha at tillering stage and spraying of Monocrotophos 36% 1100 ml/ha or Chlorpyrifos 20% 2000 ml/ha at the panicle initiation stage provides satisfactory protection to the paddy crop against internal feeders. Spraying of Monocrotophos 36% 1100 ml/ha or Imidacloprid 100 ml/ha, or Fipronil 5% 800 ml/ha is helpful in managing leaf and plant hoppers.