Package & Practices of Rice In Bihar

1. Name of the Crop

Paddy/Rice

2. Family

Gramineae

3. Scientific Name

Oriza sativa

4. Varieties

(A) For Kharif Season

(a) Upland/Rainfed Condition : Pusa 2-21; Turanta (only 75 days crop); Prabhat (only 90 days crop); C.R. 44-35 (Saket-4); Saroj; Birsa Dhan 105; Birsa Dhan 201; Birsa Dhan 202; Dhanlaxmi; Kanchan; Kalinga -III; Richharia; Aditya; Tulasi; Vandana.

(b) Medium Land : B.R.34; I.R.36; C.R.1002; Rajendra Dhan 201; Sita; Kanak; Mansuri; Sujata; Jai shree; Raj Shree; Pankaj; Swarna; Janaki; Radha; Savitri; Salivahana, MTU-7029, Sonam, BPT-5204, BPT-1001, Nata Mahsuri, Heera, Satyam, Punjab Parimal.

(c) Low Land : B.R.8; C.R.1002; Satyam; Kishori; Raj Shree; Pankaj; Swarnadhan; Mansuri; Shyamala; Kranti; Surekha; Vaidehi; Radha Shakuntala; Santosh; Mahamaya; T 141.

(d) Deep Water : Janaki; Vaidehi; Sudha; Jaladhi-I; Jaladhi-II; Jalmagna.

(B) For Winter Season : Gautam; Dhanlaxmi; Richharia; Saroj.

(C) For Summer Season : Gautam; Pusa-33; Pusa-2-21; C.R. 44-35 (Saket-4); Prabhat (only 90 days crop); Turanta (only 75 days crop).

(D) Scented Rice : Sugandha; B.R.-9; Kamini; Katarni, Basmati 370.

(E) Hybrid Rice : PA 6201, Hybrid-6204.

5. Climate

Temperate.

6. Rainfall

120-140 cm.

7. Temperature

21~37 Degree Celsius.

8. Soil

Heavy to Sandy Loam.

9. Time of Sowing/Harvesting

Seasons	Sowing	Harvesting
(A) In Kharif	June	October-November
(B) In Rabi/Winter	October-November	April-May
(C) Summer	1-15 March	June-July

10. Time of Transplanting

25~30 Days After Sowing (DAS).

11. Seed Rate

(a) Direct Sowing : 90~100 Kg/Ha.
(b) Transplanting : 30~50 Kg / Ha.

12. Seed Treatment

60 gm Seresan 2.5% WP or other Organo Mercurial Fungicides (Seed should be dipped in the water).

13. Spacing

(a) 20 X 30 cm.
(b) 2-3 Seedlings/Hill.

Nursery Area : 1/20th parts for one hectare.

14. Manures and Fertilizers

FYM/Compost	:	10~15 Cartload (Compost: N=0.5~0.5%; P=1.5%; K=2.3%)
Nitrogen	:	100~150 Kg/Ha.
Phosphorous	:	50~60 Kg P_2O_5/Ha. ($P = P_2O_5 \times 0.44$ & $P_2O_5 = P \times 2.29$)
Potash	:	40~50 Kg K_2O/Ha. ($K = K2O \times 0.83$ & $K_2O = K \times 1.20$)
Zinc Sulphate	:	25 Kg/Ha. (22~35% Zn)
Green Manuring Crops	:	Sanai; Dhaincha; Moong/Urd, etc.

15. Weed Management

(A) Hand Weeding

2 Times

(B) Chemical Weeding

(i) Direct Sowing :

(a) As Post-Emergence

Spray Butachlor 50 E.C. or Thiobencarb 50 E.C. @ 2-3 litre/ha in 700-800 litre of water after 2-3 days of sowing to control all types of weeds.

(b) As Pre-Emergence

Spray Alachlor 50 E.C. or Butachlor 50 EC @ 4 lit./ha before sowing in upland condition to check the germination of all weed seeds.

(ii) Transplanted Rice Field : Spray Anilophos 30 E.C. 0.4 lit./ha or Oxyflorfen 200 g/ha or Butachlor 50 E.C. 2 lit./ha in 600-700 lit. of water after 5-7 days of sowing to control all types of weeds. Standing water in the field shouldn't be > 5 cm.

(iii) Deep Water Rice : Apply Butachlor 5% or Thiobencarb 5% or Anilophos 5% granules 20-25 Kg or Copper Sulphate Powder @ 15-20 Kg/ha mixed with 100 Kg sand and broadcast in the field after 2-3 days of transplanting to control aquatic weeds.

16. Insects/Pests and their Management

(a) Stem borer or leaf cutting insects : To control the insects like leaf roller, Case worm, Army insects etc. spray Chlorpyriphos 1 lit. or Endosulfan or Quinolphos 1.5 lit./ha and add Tipol 5 ml/10 lit.of water during at the time of spray. To control Babhani insects spray Phosphymidon @4-5 ml/10 lit.of water or Monocrotophos @ 1 ml/lit. of water.

(b) Juice sucking insects : To control the insects like Madhua , Dhahiya insects and Thrips apply granular insecticides like Carbofuron, Forate, Quinolphos etc. Beside these, farmers can spray Phosphymidon @ 4-5 ml/10 lit.of water or Monocrotophos @ 10 ml/10lit. of water or Methyl Dymeton (Metasystox) 1 ml/lit. of water. Grow resistant rice varieties like Kanak, Satyam, Kishori and Satyam to control the insects like Madhua or broadcast Thimate 10 per cent granules @ 10 Kg + 5 Kg Neem cake in 2-5 cm standing water in the field.

(c) Rice Gandhi Bug : To control the Rice Gandhi Bug broadcast Endosulfan 4 per cent dust or Quinolphos 1.5 per cent dust @ 10 Kg/acre.

(d) Gallmidge Fly (Sarha insects) :
(1) To control Gallmidge Fly grow resistant rice varieties like I.R. 36 and Rajendra Dhan 202.
(2) Dip the root of the seedling before transplanting in solution of Chlorpyriphos 20 E.C. @ 0.02 % + 4 % urea (0.5 lit. Chlorpyriphos in 25 lit. of water) for 3-4 hours.
(3) Where Gallmidge is a serious problem in every year, apply Carbofuron 3G @16 Kg or Forate 10G @ 5Kg or Quinolphos 5G @ 10 Kg per hectare after 15-20 days of transplanting. Repeat the same insecticide after 40 days of transplanting. During application of the insecticide 6-7 cm standing water for 3-4 days in the field is essential.
(4) Spray liquid insecticides like Monocrotofos 36 E.C.@ 1000 ml/ha or Fenthion 100 E.C. @ 500 ml/ha or Fosalon 35 E.C. @ 1500 ml/ha.
(5) Apply 5 % Neem oil to control Gallmidge.

(e) Brown & Green Hopper : To control both types of hopper apply Furadon 3G granules @ 30 Kg per hectare or Thimate 10 % @ 10 Kg/ha or Dimecron 100E.C. @ 0.5 ml in one litre of water or Rogor 30 E.C. @ 1.75 ml in one litre of water.

(f) Rice Hispa : Drain out the field. For chemical control apply Endosulfan 35 E.C. @ 1.25 lit./ha or Quinolphos 25 E.C. @ 1.25 lit./ha or Phosphymidon 85 E.C.@ 300 ml/ha.

Pest Management

(a) Snails :
(1) Effective control of snails to collect their eggs and dip in 10% salt solution.
(2) To kill the snails apply Carbofuron 3G @ 25 Kg/ha.

(b) Rat :
(1) Aluminium Phosphoric – keep 3 gm pillets in each live burrow and close the hole with mud.
(2) Zinc Phosphoid – Mix 1 gm Zinc Phosphoid with 40 parts edible flour + linseed oil and make 5 gm pillets as bait.
(3) Bromodiolon : Keep 15-20 gm poisonous bait in each burrow.

17. Diseases and their Management

(a) Blast : Casual Organism : **Pyricularia Grisera**

Symptoms : The leaves show spindle shaped spots with grey centre and dark brown margin. The lesions enlarge and cause drying of leaves. The nodes and neck regions turn black and cause rotting and breaking with complete/partial chaffiness of earhead.

Intermittent drizzles, cloudy and overcast conditions, long dew periods, continuous low night temperature (below 20 degree celcious), high relative humidity and susceptible varieties spread disease.

Control : (a) Grow resistant varieties like IR 20 IR-8, Jaya, Pankaj Ratna etc. (b) Seed treatment with Agrosan G.N. or Seresan or Thiram or Carbendazim @ 2 g/Kg of seeds. (c) Spray 0.1 % Hinosan 50 E.C. (4-5 times), Carbendazim 250 gm or Tricyclazole 75 wp @ 500 gm/ha.

(b) Brown Spot : Casual Organism : **Helminthosporium Oryzae**

Symptoms : The leaves show oval shaped foliar spots with yellow halo.Severely affected field presents a reddish appearance. Grain become discoloured.

Control : (a) Grow resistant varieties like IR-24, Bala, Krishana etc. (b) Seed treatment with Thiram or Carbendazim @ 2 g/Kg of seeds. (c) Spray Edifenphos @ 500 ml/ha or Mancozeb @ 1 Kg/ha. (d) Application of Neem coated urea.

(c) Sheath Blight : Casual Organism : **Rhizoctonia Solani**

Symptoms : The disease affects at tillering stage.The infection starts in the form elliptical or oval greenish grey spots appearing on the leaf sheaths near the water level. These enlarge as irregular, elongated spots with white centre brown margin and progressively spread upwards on stem and leaves. The entire plant is blighted and dries up.

A dry spell followed by shower, high relative humidity, closer planting, excess N application favoure to spread the disease.

Control : (a) Grow resistant varieties like Rajendra Dhan 201, IR 36, IR 20, Saket, Prabhat, Turant Dhan, Raj Shree etc. (b) Seed treatment with Carbendazim @ 2 gm/Kg of seed. (c) Adequate drainage facilities to be provided. (d) Spray Streptocyclin 250 gm and Blitox 50 E.C. @ 2.5 Kg in 1000 lit. of water 3 times at 10-15 days interval, Endofil –M 45 @ 3 gm/ lit. of water.

(d) Sheath Rot : Casual Organism : **Saracladium Oryzae**

Symptoms : The Diseases affects at booting stage. The uppermost leaf sheath enclosing the young panicle shows oblong or irregular spots with grey centre and brown margin. The boot leaf becomes brownish black and rotten. The grains ill filled and discoloured. The disease spreads through airborne conidia. Closer planting high humidity and low temp. (25-30 C), injuries caused by earhead bug and mealy bugs, predispose the plants to infection.

Control : (a) Application of gypsum @ 500 Kg/ha basally or in two equal splits (basal and tillering stage). (b) Spray Bavistin @ 500 gm or Endofil –M 45 @ 2.5 Kg /ha, Dimecron or Metasystox along with Edifenphos @ 500 ml or Carbendazim @ 250 gm or Mancozeb @ 1 Kg/ha at boot leaf stage.

(e) Bacterial Leaf Blight : Causal organism : **Xanthomonas Oryzae**

Symptoms : It is also known as seedling blight in nursery. Death of young plants are observed 2-3 weeks after transplanting. Appear as yellowish or dull greenish water soaked spots or straw coloured lesions at the tip of the leaves which latter extend downwards and towards the centre with characteristic wavy margins. The leaf becomes blighted and turns straw coloured under cool and humid conditions, minute yellowish crusts or pearly, bead like bacterial exudates can be seen over the infected leaf tissue.

Control : (a) Grow resistant varieties like IR-20, IR-36, Saket-4, Rajendra Dhan 200, Pusa-2-21, Ratna etc. (b) Spray and 5 gm Agrimycin-100 and 500 gm Copper oxychloride e.g. Fytolan,Blitox 50 in 500 lit. of water per hectare 3-4 times. (c) Spray Streptomycin sulphate + Tetracyclin combination 300g + Copper oxychloride @ 1.25 Kg/ha and repeat after 10 days. (d) Spray Nickel nitrate) @ 0.3 %.

(f) Rice Tungro Virus : **RTV**

The virus is transmitted by the Green leaf hopper N. virescens and N. niggropictus.

Symptoms : The diseased plants exibit orange yellow discolouration of leaves from the tip downwards. The young leaves show mosaic mottling. The plants are dwarfed with poor tillering and become sterile.

Control : (a) Grow resistant varieties like IR-20, Ratna etc. (b) Spray Dyzinon a.i. @ 1.5 Kg/ha 5 times. First spray10 days after sowing and rest after transplanting at 15, 30, 45 and 60 days. (c) Use light trap to attract and control the leaf hopper vector.

(g) Grain Discolouration :

The discoloured grains are found associated with fungi like Helminthosporium sp., Curvularia lunata, Saracladium oryzae, Alternaria tenuis, Fusarium moniliforme, Cephalosporium sp. and Phoma sp. The disease appears on the grains during the maturity stage when there is incessant rains. The disease is more severe during 2nd season.

Control : (a) Seed treatment with Thiram or captan @ 1gm/Kg of seed. (b) Spray Mancozeb @ 1 Kg or IBP 500 ml or Carbendazim @ 250 gm/ha at boot leaf stage.

◆◆◆