

Package of Practices (POP) PADDY CROP

Paddy, or rather rice (*Oryza sativa*), is an important member of the family Graminae . It is a plant of Asian origin and the second most important crop in India, next only to wheat. It forms the staple food of more than 65% of the population. Almost 90% of the world's total paddy production comes from Asia. Among the Asian countries, China and India remain the world's top two paddy producers. Cultivated paddy belongs to two species: *O. sativa* which originated in Asia and *O. glaberrima* which originated in West Africa. Of the two, *O. sativa* is by far the more widely utilized. Asian cultivated paddy has evolved into three eco-geographic races – *indica*, *japonica* and *javanica*. More than 600 improved varieties of *indica* paddy have been released for cultivation since 1965.



Field Preparation:

- On receipt of showers during the months of May - July repeated ploughing are done to conserve the moisture, destroy the weeds and break the clods.
- More care should be taken to level the field to zero level. After inundation puddling has to be done as that of transplanting.
- Shallow trenches (15 cm width) at an interval of 3m all along the field will facilitate the draining of excess water at the early growth stage.

Package of Practices (POP) PADDY CROP

Varieties and seasons:

1. Short duration varieties

- Season: Kharif (April – September), Rabi (October – December), Summer/Zaid (January – March)

| Variety | Duration(Days) | Suitable Zone |
|----------------|----------------|---|
| Madhu | 120-125 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Dry Zone |
| Mandya Rani | 130-135 | North Eastern Transition Zone, North Eastern Dry Zone, Northern Dry Zone and Northern Transition Zone |
| Jothi | 125-130 | Northern Transition Zone |
| Shakthi | 120-125 | Coastal Zone |
| Amrut | 105-110 | Northern Transition Zone |

2.2: Medium Duration Varieties

Season : Kharif (April – September), Rabi (October – December), Summer/Zaid (January – March)

Package of Practices (POP)

PADDY CROP

| Variety | Duration(Days) | Suitable Zone |
|---------|----------------|--|
| Jaya | 140-150 | North Eastern Transition Zone, North Eastern Dry Zone, Northern Dry Zone, Northern Transition Zone and Hill Zone |
| Rasi | 125-130 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Transition Zone |
| Prakash | 140-145 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Dry Zone |
| IR – 20 | 130-145 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Dry Zone |
| Puspha | 125-135 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Dry Zone |
| Mangala | 105-130 | North Eastern Transition Zone, North Eastern Dry Zone, Northern Dry Zone, Northern Transition Zone and Hill Zone |

Package of Practices (POP) **PADDY CROP**

| | | |
|--------------------|---------|--|
| Karna | 130-135 | North Eastern Transition Zone, North Eastern Dry Zone, Northern Dry Zone, Northern Transition Zone and Hill Zone |
| Avinash/Gama - 318 | 135-145 | Northern Dry Zone and Northern Transition Zone |
| MTU1001/Vijetha | 130-135 | Northern Transition Zone |
| Pragathi | 130-135 | North Eastern Transition Zone, North Eastern Dry Zone and Northern Dry Zone |
| Mandya Rani | 140-145 | Northern Transition Zone |
| Phalguna | 135-140 | Coastal Zone |

2.3: Long Duration Varieties

Season : Kharif (April – September)

| Variety | Duration(Days) | Suitable Zone |
|---------|----------------|--|
| Abilash | 155-165 | Northern Transition Zone and Hill Zone |

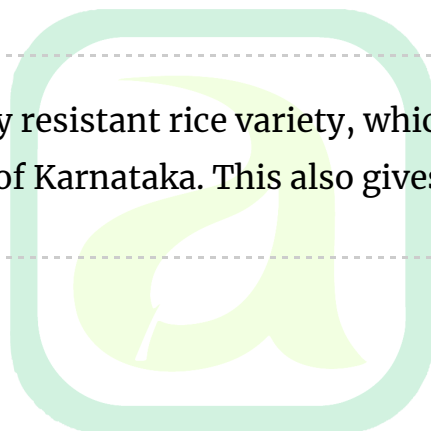
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|-----------|---------|--|
| Intan | 160-170 | Northern Transition Zone and Hill Zone |
| Hemavathi | 160-170 | Hill Zone |

2.4:Drought Resistance varieties

Drought resistant varieties

- Kumeru is a drought resistant rice variety cultivated in the hilly areas of Karnataka during rainy season.
- Chare is a drought-resistant variety grown in Karnataka, which gives long straw that can be used as cattle feed or put to some other alternative use.
- Kayame is a traditionally grown rice variety of Karnataka, which is resistant to both drought and alkalinity, and it gives tasty boiled rice.
- Moradda is a red, tasty, big size rice variety that is resistant to both drought and alkalinity. It grows faster and is cultivated during three seasons in Karnataka.

- Kalame is an alkalinity hardy variety grown in coastal areas and it has medicinal properties.
- Jholaga is a salinity resistant rice variety, which is traditionally grown in coastal regions of Karnataka. This also gives long straw.



3: Seed Treatment.

Seeds and seedlings are vulnerable to many soilborne and foliar pests. Insects and pathogens can destroy germinating seeds and young plants, which are relatively tender and lack food reserves to recover from injuries or to survive extended periods of stress. Seed treatments can protect the seed and seedling from attack by certain insects and pathogens.

Before seed treatment: Soak the seeds in water. Tie the seeds in a small gunny bag or cloth bag and soak it in water for 12 hours. Later, remove the bag from the water and cover it with a moist gunny bag. The following day, soak the seeds in water for eight hours again. Later, remove the seeds from the water and sow them in the nursery. This method helps to improve the germination capacity of the seeds.

Take the recommended quantity of seeds in a container and wet the required seeds in water. To this add recommended dose of required product and mix well to form a uniform coating on the seeds. Put the treated seeds in gunny bag and keep the weight on it or make a heap and cover it with gunny cloth or plastic paper. Leave it for 24 hrs for germination to take place. Then sow the pre-germinated seeds in prepared nursery beds.

Package of Practices (POP) PADDY CROP

Option 1: Multiplex Chirayu (*BACILLUS SUBTILIS* and *TRICHODERMA HARZIANUM*) @ 1.5 kg for seeds (30 kg) required per acre.

Option 2: Carbendazim (Nagcarzim or Benmain or Bavistin) 100gm + 2 BROMO 2 NITRO-PROPANE- 1,3 DIOL; 95 % w/w 20 gm + (Bactinash) Humic Acid 250 mL (Jivras or Stanohume-L) for treating seeds (30 kg) required for one acre.

4: Nursery Management.

Nursery Preparation:

Inputs for Nursery: Around 320 m² nursery area is required for raising seedlings needed for one acre of land.

1. 30 kg of Bioorganic Manure (Multiplex Annapurna or Anshul compact or MBF Brown Gold or JK Compost) +
2. 1kg Bio-activator Mixture (Navajeevan – G or trizyyme G+ or Biozyme granules) +
3. 100 gm Safe root (consortium of *PACILOMYCES LILACINUS* + *TRICHODERMA HARZIANUM*) per bed.

Mix all these with the soil and sow the pre-germinated seeds.

Fertilizer application for nursery area 10 to 12 days after sowing.

500 g Ammonium Sulphate (FACT or MCF or Mahadhan) +

300 g Single Super Phosphate (Coromandel OR MCF or Mahadhan) +

100 g Muriate of Potash (IFFCO or RCF or MCF or Jaikisaan)+

75 g Zinc high (Srushti or Borosaan or Micelf-16) +

30 g Carbofuron (Furadon or Carbomain) granules per bed.

The recommended dose of Fertilizer Application: NPK – 40:30:30 kg/ per acre

5. Major Nutrients

| Combination | kg | |
|---|------|--|
| Urea (46 % N) | 61.4 | Mangala Urea or GROMOR Urea or FACT Urea or IFFCO Urea or VIJAY Urea or Nagarjuna Urea or Ujjwal Neem coated Urea or SPIC Urea or KRIBHCO Urea or Jai kisan Urea |
| DAP (18 % N; 46 % P ₂ O ₅) | 65.2 | Mangala DAP or Gromor DAP or IFFCO DAP or Vijay DAP or SPIC DAP or Jaikisaan samrat (DAP) or Mahadhan chetak(DAP) |
| MOP (60 % K ₂ O) | 50.0 | Mangala MOP or GROMOR MOP or FACT MOP or VIJAY MOP or JAIKISAN Suraksha (MOP) or Mahadha Potash (MOP) |

Package of Practices (POP)

PADDY CROP

| Combination 2 | kg | |
|----------------|-------|--|
| 10:26:26' | 115.4 | MANGALA 10:26:26 or GROMOR 10:26:26 or IFFCO Grade I - 10:26:26 or Jai Kisaan Samart[10 :26 :26] |
| Urea (46 % N) | 61.9 | Mangala Urea or GROMOR Urea or FACT Urea or IFFCO Urea or VIJAY Urea or Nagarjuna Urea or Ujjwal Neem coated Urea or SPIC Urea or KRIBHCO Urea or Jai kisan Urea |
| MOP (60 % K2O) | 0.0 | Mangala MOP or GROMOR MOP or FACT MOP or VIJAY MOP or JAIKISAN Suraksha (MOP) or Mahadha Potash (MOP) |

| Combination 3 | kg | |
|---------------|-------|---|
| 20:20:00' | 150.0 | SPIC 20:20:0:13 or VIJAY complexes 20:20:0:13 or IFFCO 20: 20: 0:13 or FACT 20:20:0:13 or MANGALA 20:20:00:13 or Jai Kisaan Sampanna (0 :20 :00:13) |

Package of Practices (POP)

PADDY CROP

| | | |
|-----------------------------|------|--|
| Urea (46 % N) | 21.7 | Mangala Urea or GROMOR Urea or FACT Urea or IFFCO Urea or VIJAY Urea or Nagarjuna Urea or Ujjwal Neem coated Urea or SPIC Urea or KRIBHCO Urea or Jai kisan Urea |
| MOP (60 % K ₂ O) | 50.0 | Mangala MOP or GROMOR MOP or FACT MOP or VIJAY MOP or JAIKISAN Suraksha (MOP) or Mahadha Potash (MOP) |

Micronutrients (Micronutrient Mixtures): 10-15 kg per acre Multiplex Srushti or Kiecite Powder or Mangala Borosan + 90 % Bentonite Sulphur granules 10 kg (Multiplex Fertisulph or Suphur MAX G or Gromor Sulphur or Sulphur Bentonite 90 % (Granular) or Gandhak-90 or MAHADHAN BENSULF or Sulfonite)

6: Transplantation.

Before Transplanting during land preparation soil application

Soil Application: Apply 120 to 220 kg Bio organic Manure (Multiplex Annapurna or Compacts or MBF Brown Gold or JK Compost) +

5 kg NALPAK + 1 kg Safe root (Consortium of PACILOMYCES LILACINUS + TRICHODERMA HARZIANUM)

After transplanting 10 to 15 days

1. Bioactivator Granules 10 kg/acre (Navajeevan- G or Mangala gold or

2. Biozyme granules or SPIC EM POWER Granules) +
3. Secondary Nutrients (Soil Conditioners) 30 kg per acre (Multiplex Samruddhi or MCF Setright or Ranadey Satrite) +
- 4. Fertiliser application**
 1. Urea : 30 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT) +
 2. DAP: 35 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT) +
 3. MOP: 25 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT)
1. Micronutrients 5 kg per acre Multiplex (Srushti or Kiecite Powder or Mangala Borosan)

After transplanting 30 to 35 days

1. Secondary Nutrients (Soil Conditioners) 20 kg per acre (Multiplex Samruddhi or MCF Setright or Ranadey Satrite)
2. Fertiliser application
3. Urea : 30 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT) +
4. DAP: 30 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT)+
5. MOP: 25 kg (IFFCO or KRIBHCO or RCF or MCF or Jai Kisaan or Mahadhan or FACT)
6. Micronutrients 5 kg per acre (Multiplex Srushti or Kiecite Powder or Mangala Borosan)
7. *After transplanting 45 to 50 days*
8. Ammonium Sulphate 50 kg (FACT or MCF or Mahadhan)

7: Irrigation.

Most of the paddy varieties requires standing water for growth and development proper water management is required at high importance. Paddy requires irrigation water at critical stages like tillering stage, panicle initiation stage and grain filling stages. So water management is highly important for paddy crop.

8: Weed Management.

Common weedicides for control weeds in paddy field Pendimethalin 1.3 L/acre (Tata Panida or Bunker) OR Pretilachlor 0.25 kg/acre (Target Rifit 50 EC or Rifit plus Preet or Prince) on 5th day after of transplanting. Adora or Ricestar or Raft are also used to control weeds in paddy crop.

9: Crop Protection.

Common foliar sprays:

1st spray – 15 to 20 days after transplanting.

Pests during this period– leaf folder, green hopper.

Diseases during this period – Brown spot.

Mancozeb (Speed or Manzate or Eurofil or Sixer or Indofil M -45 or Dithane M -45 or Uthane M- 45) 2 g/L + Mahaphal 2 mL/L + Sambrama 1 tab/15 L+ Monocrotophos (Nagphos or Monomain or Crotocel) 2 ml/litre + Plant extract (Biostrike Or Anshul biofinish) 3 ml/litre.

To control many of insects in addition to the foliar spray the granulated insecticides are applied like Carbofuran 3% (3g) (Furadon or Carbomain) OR

Cartap Hydrochloride 4% (4g) (Nagtap or Cartox G or Kritap or Boregan G) about 5 to 10 kg per acre.

2nd Spray – 35 to 40 days after transplanting

Pest during this period- leaf folder, stem borer, Gall midge, Brown plant hopper Case worm)

Diseases during this period – Brown spot.

Carbendazim + Mancozeb combi (Jodi or Dosth or Macoban C) 2 g/L + Paddy Special 2.5 gm/L OR Mangala Paddy Special 2.5 mL/L OR Prokissan 1gm/L + Biostrike 3mL/ L + Chloropyrifos 2 ml/L (Nagphyriphos or Border- 50 or Tricel or Anth – 50)

3rd Spray – 60 to 65 days after transplanting

Pest during this period - Gall midge, Brown plant hopper, Ear head bug);

Diseases during this period - Sheath blight, Sheath rot, Brown spot

COC 50%WP 2 gm/L (Nag coper or Blue copper or Blitox or Cuprina or MainCop or Trocop or Dhanucop) + 2 BROMO 2 NITRO-PROPANE- 1,3 DIOL; 95 % w/w

0.5 g/L (Bactinash or Bactrinashak) + Acephate 2gm/L (Nagace or Acenmain or Tameron gold or Hunk or Acefex or Tremor or Rasayanphate) + Nutrient mixture 2 mL/L (Kranti or Mangala bio 20) or General liquid 3 mL/L (Multiplex General liquid or Anshul Liquid magic or Kiecite G) + Plant extract (Biostrike) 3 mL/L.

4th Spray – 90 to 95 days after transplanting.

Pest during this period- Gall midge, Brown plant hopper, Ear head bug.

Package of Practices (POP) PADDY CROP

Diseases during this period - Bacterial leaf blight, neck blast

Tricyclazole 75%WP 1.5gm/L (Safari or Blastogan or Blastin or Tric or Logik) + Bio Jodi (PSEUDOMONAS FLUORESCENS+ BACILLUS SUBTILIS) 5gm/L + Buprofezin 2 ml/L (Pole star or Dupont Jawaas or PI Bupro or Bipimain or Tapoz or Flotis or Banzo) + Zinc EDTA 0.5gm/L (Swarna Zn or Chelamin Gold or Chelamin)+ Aminoacid mixture 2ml/L (Samaras or Spic Max + Alpha naphthyl acetic acid 0.25 ml/L (Nagamrutha or Planofix) + Plant extract (Biostrike) 3 mL/L.

Note: Multiplex Equinox can be added to the spray solution to all the plant protection chemicals to perform better. Equinox helps decrease the pH of spray solution where higher pH of spray solution or spray water will affect the effectiveness of plant protection products. Equinox can be added to spray water until that water turns aqua blue indicating goodness of water to use for mixing the plant protection products and spray.

Pest Management:

1.To Control of Leaf folder, green hopper.

Monocrotophos 36% SL 2 mL/L (Nagphos or or Crotocelel or Monomain) + Plant extract (Biostrike) 3 mL/L OR Chloropyrifos 2 ml/L (Nagphyriphos or

Border- 50 or Tricel or Anth 50) OR Acephate 75% WP 2g/L (Nagace or Acenmain or Tamaron gold or Hunk or Acefex or Tremor or Rasayanphate). In addition to the foliar spray, the granulated insecticides are applied like Carbofuran 3 % (3g) (Furadon or Carbomain) OR Cartap Hydrochloride 4 % (4G) (Nagtap or Cartox G or Kritap or Boregan G) about 5 -10 kg per acre.

To Control of stem borer, Gall midge, and Case worm.

Biostrike 3mL/L + Chloropyrifos 2 ml/L (Nagphyriphos or Border- 50 or Tricel or Anth – 50) OR Monocrotophos 36% SL 2 mL/L (Nagphos or or Crotoceal or Monomain)

To control of Brown plant hopper.

Buprofezin 2 ml/L (Pole star or Dupont Jawaaw or PI Bupro or Bipimain or Tapoz or Flotis or Banzo)

In addition to the Foliar sprays to control Brown plant hoppers the granulated insecticides are applied to soil like Forate 10 % (10G) @ 5 to10 kg per acre (Foratox).

Disease management:

To control the Brown spot.

Mancozeb (Speed or Manzate or Sectin or Eurofil or Sixer or Indofil M -45 or Dithane M -45 or Uthane M- 45) 2 g/L OR Carbendazim 12% + Mancozeb 63% WP combi 2 g/L (Jodi or Bendaco or Macoban C or Avatar) 2.5 g/L.

To control of Sheath blight, Sheath rot, Brown spot, Bacterial leaf blight.

COC 50%WP 2 g/L (Nag coper or Blue copper or Blitox or Cuprina or MainCop or Trocop or Dhanucop) + 2 BROMO 2 NITRO-PROPANE 1,3 DIOL, 95 % w/w 0.5 g/L (Bactinash or Bactrinashak)

Package of Practices (POP) PADDY CROP

To control neck blast.

Tricyclazole 75%WP 1.5g/L (Safari or Blastogan or Blastin or Tric or Logik) +

Bio Jodi (PSEUDOMONAS FLUORESCENS+ BACILLUS SUBTILIS) @ 5g /L.

10: Harvesting.

Paddy crop will be usually harvested at suitable time based on varieties and races. Generally based on long duration, short duration and medium varieties. Crop turns yellow with grain filled panicles bend towards down is the indication for initiation for harvest.