RECOMMENDATIONS FOR RICE CROP PRODUCTION AND PACKAGE OF PRACTICES FOR *KHARIF*, 2014 & *RABI*, 2014-15

Varieties Recommended for *Kharif*

Situation	Varieties for Southern Zone
Early Kharif Plantings	Bharani (NLR 30491), Somasila (NLR 33358), Swetha (NLR 40024), MTU 1010
Kharif Normal Plantings	Simhapuri, Tikkana, Pinakini, Sriranga, NLR 9674, Pardhiva, NLR 3041(Nellore Sona)
Kharif Aged Nursery (Aged seedlings)	Simhapuri, Tikkana, SriRanga
Low land submerged areas	Badava Mahsuri, Savitri
Saline soils	Swarnamukhi, Somasila, Deepti
Late kharif plantings	Swarnamukhi, Swathi, Sravani, Satya, Apoorva
Rainfed areas	Sri satya, Varalu, JGL 17004 (Prathyumna)
Irrigated dry situation	Tikkana, Simhapuri
BPH prone areas	Deepti, Vijetha, Cottondora sannalu

Varieties Recommended for *Rabi*

Situation	***Varieties for Southern Zone***
Rabi Normal Plantings	Swarnamukhi, Cottondora sannalu (MTU 1010), Vijetha (MTU 1001), Nellore Mahsuri (NLR 34449), NDLR 8 (Nandyal sannalu), NLR 3041 (Nellore Sona)
Saline soils	Vikas, Somasila (NLR 33358), Nellore Mahsuri (NLR 34449)
Late Rabi plantings	Swathi, Satya, Somasila, , Tellahamsa
BPH prone areas	Cottondora Sannalu (MTU 1010), Vijaetha (MTU 1001)

Brief Description of Varieties

Southern Zone

Variety	Duration (days)	Yield (T/ac)	Pest/ Disease Resistance	Special Features
Bharani	125	2.5	Tungro Virus	Fine grain
Somasila	105-110	2.5	Blast	Super fine grain
Simhapuri	160-170	3.0	Blast	-
Tikkana	165	2.6	Blast	-
Pinakini	160	2.5	Blast (T)	-
Savitri	150	2.5	-	Bold grain
Sri Ranga	170	2.5	Blast	Fine grain
NLR 9674	165-170	2.5	Blast (T)	-
Pardhiva	155	2.2	Blast	Fine grain
Swarnamukhi	135	3.2	Stemborer, Blast, Gallmidge	Super fine grain
Swathi	125	3.0	Blast	Super fine grain
Satya	120	2.5	Blast	Fine grain
Apoorva	135	3.0	Blast	Moderately slender
MTU 4870	150	2.5	BPH, BLB (T)	Non lodging, fine grain
MTU 1001	140	2.5	BPH, Blast	Fine grain
Varalu	90-95	1.6	Gallmidge 1, 3 ,5	Superfine grain
Sri satya	110	2.0	Gallmidge	Coarse grain, suitable for rainfed situation
MTU 1010	125	3.0	BPH, Blast (T)	Super fine grain
Nellore Mahsuri	125	3.0	Blast	Fine grain
Vikas	120	2.5	-	Super fine grain
Nandyal Sannalu	125	2.5	Tolerance to Blast	Fine grain
JGL 17004 (Prathyumna)	100	2.25	Blast	Fine grain and suitable for contingency situations

Sowing Nurseries and Seed Rate

- Early Kharif – April first fortnight
- Sowing up to August 15th during Kharif and from November first fortnight in Rabi
- For Nursery transplanting 20-25 Kg, for dry seed nurseries 25-30 Kg, For Direct seeding 10-12 Kg, for Direct Seeding with Gorru 16 Kg.

Nursery Management (Wet)

- Select an area of nursery, which has good irrigation and drainage facility.
- Prepare the nursery field one month before sowing
- Prepare nursery field by ploughing twice in the summer subsequently by puddling 3-4 times at an interval of 5-6 days.
- Level the field after final puddling and prepare raised beds of one-meter width and of convenient length duly forming channels for irrigation and proper drainage.
- Apply Well-decomposed FYM/ compost @ 200 kg/ 5cents nursery to improve soil condition.
- Soak the paddy seed for 16-24 hours and incubate for 24-36 hours before sowing of sprouted seed.
- Apply 2 kg Nitrogen (4.4 kg of Urea), 1 kg of `$P_2O_5$' (6.25 kg of SSP) and 1kg of `K_2O' (1.6 kg of MOP) for a nursery bed of 5 cents (200 m^2).
- Apply total `P' & `K' fertilizers and ½ `N' as basal (before final leveling and thoroughly mixed in the soil).
- Apply the remaining ½ `N' at 10-15 days after sowing depending up on seedling growth.
- Sow the sprouted seed @ 5 kg/cent (40 m^2) of nursery bed and 20 kg seed is sufficient for one acre of main field.
- Broadcast sprouted seed uniformly in seedbeds by keeping thin film of water and drain the water next day morning for proper aeration.
- Maintain alternate wet and dry during first week, after that beds can be flooded 2-3 cm depth depending up on height of seedlings.
- Apply@ 75 ml Benthiocarb or Pretilachlor with safener@ 40 ml or Butachlor @50 ml or Pyrazosulfuron ethyl @ 5 g in 10 litres of water as pre emergence application for five cents nursery to overcome weed problem
- Apply *Cyhalo fop P butyl* @ 20 ml/ 10 litres of water at 12-15 DAS to control *Echinochloa spp.* effectively.
- At the time of uprooting, the nursery should be flooded two days before to avoid root damage

Main Field

- Plough the soil once or twice in midsummer prior to main field preparation; it will help in checking the weed growth by exposing the root system of weeds. It also exposes egg masses and hibernated stages of different pests and disease to the hot Sun and helps soil to retain moisture received during summer.
- Under canal irrigation green manuring is very much suggested
- Initiate puddling at least 15 days before transplanting
- Tractor / power tiller puddling to a depth of 15 cm is enough.
- Level the field perfectly after final puddling and allow it to settle for 2-3 days before transplanting in heavy soils which helps in better water and weed control.
- Transplant 30 days old rice seedlings during Kharif and 20-25 days old seedlings for Rabi.
- Avoid usage of over aged seedlings for transplanting in rice as use of 60 or more days for long duration while more than 40 days for medium duration and more than 30 days for short duration varieties reduce the yield drastically.
- Transplant 33 hills/m^2 during Kharif and 44 hills/m^2 during Rabi at 2-3 cm depth @ 2-3 seedlings /hill
- In less fertile soils and in the case of over aged seedlings, transplant 44 hills / m^2 to reduce the yield loss to some extent.
- Make 20 cm alleyways at every 2 meters apart to facilitate free aeration and for uniform application of fertilizers, Weedicides and pest management practices.

Water Management

- Proper water management facilitates good tillering, increased nutrient use and reduce weed infestation.
- Maintain shallow depth of water (1-2 cm) at the time of transplanting.
- Increase the water level up to 5 cm depth after transplanting till crop establishment
- Maintain shallow depth of water (2-3 cm) during tillering phase of crop.
- Maintain 5 cm of water during panicle initiation to physiological maturity (10 Days before harvest) of the crop.
- Crop should not face water stress at panicle initiation, flowering and milk stages.

Nutrient Management

Recommended Fertilizers for Different Agro-Climatic Zones of A.P

Zone	Kharif (kg/acre)			Rabi (kg/acre)		
	N	P	K	N	P	K
Southern Zone	32	24	16	48	24	16

- Soil fertility and productivity of rice can be improved and maintained through integrated use of organic, inorganic and bio fertilizers in a balanced manner.
- 25-50% of recommended N through Green manures/compost /FYM/ poultry manures results sustainable yields.
- Green manuring insitu with Sesbania / Crotalaria / Pillipesara or grain legume crop residues like black gram/ green gram can sustain the soil fertility and productivity.
- Bio fertilizers like blue green algae, Azolla, Azospirillum Phosphobacteria can save about 10 – 20 % `N' & `P' requirement of rice crop.
- Apply N, P_2O_5 and K_2O @ 80: 60: 40 kg /ha during *kharif* and @ 120: 60:40 kg /ha during *rabi*. Apply entire `$P_2O_5$' & `K_2O' as basal while `N' in three equal splits (Basal + Active tillering + Panicle initiation stage). In light textured soils apply `K_2O' in two splits half at basal and half at panicle initiation along with 2^{nd} top dressing of `N'.
- Drain out the field before N topdressing and irrigate the field after 2 days only.
- Avoid top dressing of Phosphorus or Phosphorus containing complex fertilizers after 15 days of planting.
- Apply Zinc Sulphate @ 50 Kg / ha to avoid the Zn deficiency. Deficiency in the standing crop can be corrected by spraying zinc sulphate @ 0.2% (2 g /L of water). The spraying should be repeated at 5 days interval depending on the severity of the problem.
- If Iron deficiency noticed Spray of ferrous sulphate @ 20-25 g and citric acid @ 2-2.5 g/L is suggested. 2-3 sprays at 5-day interval are needed.

Weed Management

- The crop should be maintained weed free especially till 45 DAT.
- Hand weeding at 20 and 40 days after transplanting in areas where sufficient manual labour is available
- To overcome weed problem apply any one of the following herbicides keeping thin film of water. Butachlor @ 1.25 litres /acre (or) Anilophos @ 500 ml/acre (or) Pretilachlor @ 600 ml /acre (or) Oxadiargyl @ 40 grams (mixed with one litre of water) with in 3 to 5 days of of transplanting or spray Pyrazosulfuran ethyl @ 80-100 g/ acre at 8-12 DAT or Bensulfuron methyl @ 35 g /acre as pre to post emergence (3-25 DAT). 2,4- D SS @400 g / acre at 20-25 DAT to control broadleaved weeds .

Insect Pests and Diseases

Cultural Practices Recommended for Reducing the Build up of Insect Pests

- Summer ploughing
- Grow suitable resistant varieties

- Use recommended doses of fertilizers
- Clipping of the leaf tips of seedlings while planting
- Adopt normal spacing
- Formation of alleyways.
- Alternate wetting and drying
- Weed management

Economic Threshold Levels of Insect Pests

S. No.	Insect Pest	Stage of the Crop	Economic threshold level
1	Stem borer	Nursery and Tillering	One adult or one egg mass per one sqm or 5% of dead hearts per sqm.
2	Gall midge	Nursery and Tillering	One silver shoot per hill or 5% galls per sqm.
3	BPH/WBPH	Tillering	10-15 insects per hill
		After Flowering	20-25 insects per hill
4	Leaf folder	All stages	One to two damaged leaves per hill
5	Hispa	Tillering stage	Two adults per hill or two damaged leaves per hill
6	Green leaf hopper	Nursery	One or two insects per sqm
		Tillering	10 insects per hill
		Flowering	20 insects per hill
7	Gundhi bug	Flowering	One to two adults per hill

Chemical Control

Tillering Stage

Stemborer, Thrips and Hispa

- Spray monocrotophos @ 36 SL 1.6 ml or chlorpyriphos 20 EC @ 2.5 ml or phosphamidon 40 SL@ 2.0 ml/litre of water.

Gallmidge

- Apply phorate 10G @ 12.5 kg/ha or carbofuran 3 G @ 25 kg/ha at 15 DAT in 1– 2 inches of standing water.

Leaf folder

- Spray profenophos @ 2.0 ml or chlorpyriphos @ 2.5 ml or monocrotophos 36 SL @ 1.6 ml/litre of water.

Hispa

- Spray profenophos @ 2.0 ml or chlorpyriphos @ 2.5 ml or monocrotophos @1.6 ml/litre of water

Leaf mite

- Dicofol @ 5.0 ml or wettable sulphur @ 3 g /l of water.

Panicle Initiation to Booting Stage

BPH/WBPH

- Spray acephate @ 1.5 g or monocrotophos @ 2.2 ml or ethofenprox @ 2.0 ml or fenobucarb @ 2.0 ml or imidacloprid @ 0.25 ml or thiamethoxam @ 0.2 g or Buprofuzin 1.6ml per litre of water.
- Spray fluid (200 litres/acre) should be directed towards the base of the plant.
- Avoid spraying of combination of insecticides and synthetic pyrethroids.
- If second spray is warranted alternate the previous chemical preferably belonging to another group.

Stemborer

- Cartap hydrochloride 50 WP 2.0 g or acephate 1.5 g or profenophos 2.0 ml Chlorantriniprole 0.4 ml/litre of water (or) apply cartaphydrochloride 4G @ 8 kg/acre when the adult moths/egg masses @ one/ sq.m are noticed in the field.

Leaf folder

- Spray cartaphydrochloride 2.0 g or acephate 1.5 g or profenophos 2.0 ml /litre of water.

Panicle mite

- Spray profenophos 2.0 ml or dicofol 5.0 ml/litre of water

Post Flowering

BPH/WBPH

- The insecticides as recommended at boot stage should be used.

Cutworm

Irrigate the field and spray in the evening hours with any of the following combinations of dichlorovos 1.0 ml + chlorpyriphos 2.5 ml/litre of water.

Rice Diseases

Disease	Time of application	Fungicide	Dose	No. of applications & time interval
Sheath blight	At the initiation of the disease. Normally around 45 days after transplanting in *kharif* and 30 days after transplanting in *rabi*	Hexaconazole 5EC Validamycin 3L Propiconazole25 EC	@ 2ml/l @2ml/l @ 1ml/l	2 sprays at 15-day interval
Blast a) Leaf blast	At the initiation of the disease under favourable weather conditions	Tricyclazole / Isoprothiolane	75 WP @ 0.6g/ml 40 EC @1.5 ml/l	2 to 3 sprays depending on the severity & spread of the disease at 15 days interval
b) Neck blast	i) Under disease favourable	Tricyclazole /	75 WP @	One spray

	weather conditions just before panicle emergence stage	Isoprothiolane	0.6g/ml 40 EC @1.5 ml/l	
ii) On appearance of the disease	Tricyclazole 75WP/ Isoprothiolane 40 EC	@ 0.6g/ml @1.5 ml/l	One spray	
BLB	No chemical available. Management is mainly through rationalization of nitrogenous fertilizer application	---	---	---
Stem rot	At the appearance of the disease (Normally from maximum tillering to crop maturity stage)	Validamycin 3L / Hexaconazole 5EC / Propiconazole 25 EC /Carbendazim 50 WP/Benomyl 50 WP	@ 2ml/l @1ml @2ml/l @ 1g/l @1 g/l	2 to 4 sprays at 10-15 days interval depending how much early the disease has been noticed
Red stripe	At the appearance of the disease from advanced boot leaf to crop maturity stage	Carbendazim 50 WP	@ 1g/l	One spray
Sheath rot	At the appearance of the disease or at panicle emergence stage	Carbendazim 50WP	@ 1g/l	One spray
False smut	At flowering stage	Propiconazole 25 EC/ Copper oxycloride 50WP/ Carbendazim 50WP	1.0ml/l 2.0g/l 1.0g/l	One spray during evening hours

Rodent Control

For Endemic Areas

- Destruction of rodent harborage and observe rat moment.
- Reducing the number and size of field bunds
- Complete the sowing and planting uniformly in one area.
- From puddling to one month after planting, setup local traps @ 20 /acre.
- Installation of permanent bait stations from planting to flowering stage @ 5 /ha Four at corners of the field one meter inside the cropped area from the field bund and one at the centre, Bromadiolone bait @ 30 g per bait station should be replenished twice in a week.
- During crop period baiting with bromadiolone 0.005% in baits prior to primordial initiation stage of the crop.
- From primordial initiation to crop harvest smoking of burrows with "burrow fumigator"developed by APRRI & RARS, Maruteru.

Management of Rodents with Bromadiolone 0.005%

- Identify live burrows and simultaneously place 15 gm freshly prepared bromadiolone (2% poison) loose bait in packets inside the burrow when LBC is 50/ha.

- Repeat bromadiolone (2% poison) loose baiting in the active /live burrows as and when the incidence is above ETL.

Note: Control schedules should be executed on community basis to check cross infestation through migration.

Harvesting and Storage

- Harvesting should be done when at least 80 % of the grains are matured. If the crop is harvested without proper maturity it leads to loss of viability of grains and brokens in milling.
- The harvested material should be dried in the field for 2-3 days.
- The grain should be free from inert material after threshing and winnowing.
- The winnowed grains should be sun dried until the moisture content reaches < 13%.
- Both over drying and under drying will lead to breakage of the grain during processing.

High moister content during storage leads to loss of viability due to increased grain respiration and attack of storage insects and pests.