

Rice (*Oryza sativa*) Transplanted Early *Ahu*

Varieties:

Varieties	Year of rel	#Agroclimatic zone	Duration** (days)	Grain character	Reaction to blast
A. Semi dwarf					
Rasi	-	N,U,C,L,H	130-135	Medium slender	T
IR-50*	-	N,U,C,B	115-125	Long slender	S
Govind	-	N,U,B	115-125	Long slender	T
IR-36	1982	C,L,B	125-135	Long slender	T
Jaya	1969	N,U,C,B,H	140-145	Long bold	-
IR-8	-	U,C,B,H	140-145	Long bold	-
Luit	1997	U,C,L,B	100-105	Long slender	T
Kapilee	-	U,C,L,B	100-105	Long slender	T
AAU Diphu Dhan 4 (Haccha)	-	H	100	Slender	T

Refer to page iii for full forms of the abbreviations

* Not recommended for blast endemic areas

** Durations of semi dwarf modern varieties are based on experiments conducted at Titabar. Durations of traditional varieties are collected from Field trials of stations of respective zones.

Land selection:

Areas with assumed irrigation facilities should be selected. Heavy to medium textured soils are preferred.

Seed selection:

Seeds are to be put in plain water, stirred well and floated ones are to be rejected.

Sowing in nursery bed:

Seeds should be sown in nursery bed during mid February.

Seed treatment with chemicals:

A. Wet method: Same as in *boro* rice.

B. Dry method: Same as in *boro* rice

Raising of seedlings:

a) **Preparation of seedbed:** Land is to be thoroughly puddle and seedbeds of 10 m length and 1.25 m breadth are prepared with 30 cm gap in between beds.

- b) Manures and fertilizers:** In each seedbed, 20-30 kg cowdung or compost, 80 g urea, 80 g SSP and 40 g MOP are to be applied.
- c) Seed rate:** Well germinated seeds are to be sown @ 650 to 1000 g per bed. Seed requirement for transplanting one hectare of main field is 40-45 kg.
- d) Plant protection in seedbed:**
- 1) As soon as one or two blast spots are seen. ediphenphos @ 1 ml/lit of water is to be sprayed.
 - 2) In case nematode is not a problem, any one of following insecticides is to be sprayed against nursery insect pests as and when necessary. Generally an insecticidal spray 5 to 7 days after sowing is effective against most pests.

Insecticide	Dose
Chlorantraniliprole 20 SC @	30g <i>a.i.</i> /ha or 0.3 ml/lit
Fipronil 5 SC	50g <i>a.i.</i> /ha or 1.5-2 ml/lit
Imidachloprid 70 WG	24.5g <i>a.i.</i> /ha or 0.3 g/lit
Thiamethoxam 25 WG	25g <i>a.i.</i> /ha or 100 g/ha

- High volume sprayer: 400 ml of water/10 sq. m
 - Low volume sprayer: 100 ml of water/10 sq. m.
- e) Irrigation:** Standing water in the furrows between the beds is to be kept to maintain saturated condition in the seedbeds. An irrigation upto submergence of beds before uprooting of seedlings facilitates the process.

Field preparation:

1. First ploughing is to be given at 21-24 days prior to transplanting. Irrigation for soaking the land is to be applied before preparatory tillage.
2. Second irrigation is to be applied at 10-12 days prior to transplanting followed by ploughing, laddering and puddling accompanied by repairing and mud plastering of bunds. Thereafter irrigation is to be applied once again for land submergence.
3. The final puddling is done just before transplanting. Irrigation is applied before final puddling (depth of each irrigation 5±2 cm). Excess water, if any, should be drained out from the field.

Fertility management:

Well rotten FYM or compost has to be applied @ 10 t/ha in addition to the fertilizers at rates given below in areas with moderate fertility level.

Nutrient	Requirement (kg/ha)	Form	Fertilizer requirement	
			kg/ha	kg/bigha
A. Semi dwarf varieties				
N	40	Urea	88	12
P ₂ O ₅	20	SSP	125	18
K ₂ O	20	MOP	33	4

B. Tall varieties				
N	20	Urea	44	6
P ₂ O ₅	10	SSP	62	9
K ₂ O	10	MOP	16	2

In absence of SSP, Diammonium phosphate (DAP) can be applied in proportion to the quantities of N and P₂O₅ as suggested above.

Above rate of fertilizer will be valid for most of the rice growing areas of Assam. In case of poor soil, fertilizer rates may be increased to the extent of 60:30:30 kg/ha of N, P₂O₅ and K₂O, respectively. Amrit or granular mixed fertilizers could be used with proper adjustment.

Time of application of fertilizers:

Only one third of the total urea, full doses of super phosphate and potash at the time of final puddling are to be applied. The 2nd one third and 3rd one third doses of urea are to be applied at tillering and panicle initiation stages respectively. Top dressing of urea should be preceded by weeding. Super phosphate can also be incorporated into the soil at the active tillering stage (25-35 days after transplanting) along with 2nd dose of nitrogenous fertilizer.

Use of Azolla to supplement nitrogenous fertilizer:

Nitrogenous fertilizers can be supplemented by using *azolla*. About 500 kg fresh *azolla*/ha is to be inoculated in the field ponded with 5-10 cm depth of water for about 2-3 weeks prior to final puddling. At the time of inoculation 8-10 kg P₂O₅/ha in the form of SSP is to be applied in the field, and the corresponding quantities of phosphatic fertilizer is to be reduced at the time of transplanting.

Fresh *azolla* @ 500 kg/ha also can be applied in the standing water in transplanted crop after establishment of seedlings. There is no need for application of additional phosphatic fertilizer in the field at the time of inoculation with fresh *azolla* after transplanting when recommended doses of phosphatic fertilizer is applied at the time of transplanting. Thereafter, *azolla* will multiply itself to cover the field. Care should be taken to keep 5-10 cm depth of water for rapid multiplication. Normally, sufficient quantities of biomass will be produced in two weeks and then it should be incorporated into the soil. It is preferable to drain out water before incorporation taking precaution so that *azolla* is not drained out with water.

Natural depressions and ponds or tanks may be used for *azolla* multiplication outside the main field and can be incorporated at the time of land preparation @ 6 t/ha of fresh *azolla*. Nitrogen dose can even be reduced upto 50% when *azolla* is applied /incorporated in the field.

Time of transplanting:

Transplanting is done by the end of March.

Transplanting:

Transplanting has to be done by putting 2-3 seedlings/hill at a depth of 4- 5 cm. The

spacing is 20×15 cm for semi-dwarf and 20×20 cm for tall traditional varieties. A wooden line marker of required spacing may be used for this purpose.

Gap filling:

Replanting of dead hills has to be done within 7-10 days of transplanting.

Water management:

Apply irrigation at 15 cm depletion of water from soil surface measured in field installed perforated open plastic pipe (15 cm diameter and 30 cm length).

Description of the technology

A practical way to measure irrigation water precisely is by using a ‘field water tube’ (‘Pani Pipe’) to monitor the water depth on the field. After irrigation, the water depth will gradually decrease. When the water level has dropped to about 15 cm below the surface of the soil, irrigation should be applied to re-flood the field to a depth of about 5 cm over surface.

When the field is flooded, check that the water level inside the tube is the same as outside the tube. If it is not the same after a few hours, the holes are probably blocked with compacted soil and the tube needs to be carefully re-installed. The tube should be placed in a readily accessible part of the field close to a bund, so it is easy to monitor the ponded water depth. The location should be representative of the average water depth in the field (i.e. it should not be in a high spot or a low spot).

The field water tube can be made of 30 cm long plastic pipe or bamboo, and should have a diameter of 10–15 cm so that the water table is easily visible, and it is easy to remove soil inside. Perforate the tube with many holes on all sides, so that water can flow readily in and out of the tube. Hammer the tube into the soil so that 15 cm protrudes above the soil surface. Take care not to penetrate through the bottom of the plow pan. Remove the soil from inside the tube so that the bottom of the tube is visible.



Interculture:

Two weedings at 20 and 40 days after transplanting are suggested. Alternatively, weeder can be used at the time of top dressing nitrogenous fertilizer. For chemical control of weeds post-emergence herbicide bispyribac sodium @ 25.0 g a.i./ha should be applied at 2-3 leaf stage of dicot weeds and sedges.

Plant protection:

A. Insect pests: Plant protection measures are to be adopted against insect pests at their Economic Threshold Levels (ETLs) as given in Table 1.

To control rice pests, erect 50 ‘T’-perches per ha 2 ft (60 cm) above crop canopy as roosting site for insectivorous birds, which are to be removed before flowering in order to prevent activity of granivorous birds

B. Diseases:

(i) **Blast :** Hexaconazole 5EC 2g/lit is to be sprayed at tillering stage followed by two sprayings of ediphenphos @ 1 ml/lit at panicle initiation and when the tip of the panicle just comes out.

(ii) **Sheath blight:** Two sprayings of hexaconazole @ 2 ml/lit of water are to be given, the first at appearance of symptoms and the other 10 days after the first spraying.

Table 1. Damage identification, Economic Threshold Levels (ETLs) and chemical control of different insect pests of rice

Crop stage and damage identification	Key pest	ETL	Insecticide (Technical Name)	Conc. (%)	Dose
A. Nursery					
Curling of leaves, leaf blade rolls, yellowish to reddish discolouration	Thrips	Moderate to severe	Imidachlopid 70WG		24.5g a.i./ha
			Thiamethoxam 25WG		25g a.i./ha
Yellowing and withering of plants	Leaf and plant hoppers	Moderate to severe	Imidachlopid 70WG		24.5g a.i./ha
			Thiamethoxam 25 WG		25g a.i./ha
Presence of dead heart	Stem borer	Moderate to severe	Chlorantraniliprole 20SC		30g a.i./ha
			Fipronil 5SC		50g a.i./ha
B. Main field (After transplantation)					
Upon unfolding, the edge of the central leaf shows discoloured (yellowish to whitish) patches	Whorl maggot	More than 20% damaged hills upto 30 days after transplanting	Fipronil 5SC		50g a.i./ha

Leaf tissues scrapped in white parallel lines	Hispa	1 adult or 1 damaged leaf/hill	Lambda-cyhalothrin 5 EC Emamectin benzoate 1.9EC	0.035	12.5g a.i./ha 8.08 g a.i./ha
Presence of dead heart	Stem borer	1 egg mass/sq.m or 5% dead hearts	Chlorantraniliprole 20SC Fipronil 5 SC		30g a.i. /ha 50g a.i. /ha
Yellowing and withering of plants	Leaf and plant hoppers	10 insects/hill or 2 insects/hill in tungro endemic areas	Imidachlopid 70WG Thiamethoxam 25WG		24.5g a.i./ha 25g a.i. /ha
Presence of silver shoots (galls)	Gall midge	1 silver shoot/sq.m in endemic areas or 5% silver shoots in non endemic areas	Fipronil 5SC Lambda-cyhalothrin EC		50g a.i. /ha 12.5ga.i./ha
C. Active tillering stage					
Presence of tubular case by cutting the tips of the leaves, leaf tissues scrapped in white patches	Case worm	1-2 cases/hill	Chlorantraniliprole 20SC		30g a.i. /ha
Leaves are folded along margins by webbing them together	Leaf folder	More than 1 damaged leaf per hill	Chlorantraniliprole 20SC Fipronil 5SC		30g a.i. /ha 50g a.i. /ha
Presence of silver shoots (galls)	Gall midge	1 silver shoot/sq.m. in endemic areas or 5% silver short in non-endemic areas	Fipronil 5SC Lambda-cyhalothrin 5EC		50g a.i /ha 12.5g a.i./ha
Leaf tissues scrapped in white parallel lines	Hispa	1 adult or 1-2 damaged leaves per hill	Lambda-cyhalothrin 5EC Emamectin benzoate 1.9 EC		12.5g a.i./ha 8.08 g a.i./ha
Presence of dead heart	Stem borer	More than 5% dead heart	Chlorantraniliprole 20SC Fipronil 5 SC		30g a.i. /ha 50g a.i. /ha
D. Boot leaf to heading stage					
Presence of partially or completely chaffy grains in the panicle	Rice bug	1-2 bugs/sq.m	NSKE 1500 ppm	0.5%	3-5 ml/lit

Presence of white earhead	Stem borer	1 moth/sq.m.	Chlorantraniliprole 20SC Fipronil 5SC	30g a.i. /ha 50g a.i./ha
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