Rice *(Oryza sativa)*
Transplanted Normal *Ahu* Rice (Autumn Rice)

Varieties

Varieties	Year of release	*Agro-climatic Zone	Duration (days)	Av. Plant height (cm)
Semi-dwarf:				
IR 36	1982	N,U,L,B,H	130-140	105
Lachit	1992	U	125-130	95
Chilarai	1992	U, B	125-130	95
Sonamukhi	-	B	100-110	85
Luit	1997	B	100-110	110-115
Haccha	-	H	115-120	-
Dishang	1998	N,U,C, L,B	90-95	110-115

* Refer to page iii for full forms of the agro-climatic zones

** Durations are based on experiments conducted at Titabar.

*** Not recommended for blast endemic areas.

Land Selection:

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

Seed Selection:

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

Sowing in Nursery Bed:

Seed should be sown in the nursery bed during March-April.

Seed Treatment:

Wet Method: After seed selection, the seeds should be soaked directly in any of the following fungicidal suspensions for 24 hrs. One litre of fungicidal solution is required to treat 1 kg of seed.

Fungicide	Dose (g/kg seed)
Carboxin	2.0

Raising of Seedlings:

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

b) **Manures and fertilizers:** In each seedbed, 20-30 kg cow dung/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 g to 1kg per bed. Seed requirement for transplanting one hectare of main field is 40 to 45 kg. In BPH endemic areas a lower seed rate is advocated.

d) **Water Management:** Irrigation water is to be supplied in furrows to maintain saturated condition in the surface soil of the nursery bed. However, standing water to a depth of 2-3 cm should be maintained at least 2-3 days before uprooting.

e) **Plant protection in seedbed:**

i) As soon as one or two blast spots are seen, or ediphenphos @ 1 ml/lit of water is to be sprayed.

ii) Against root-knot nematode, apply, *Pseudomonas fluorescens* @ 20g / m2 at the time of sowing

iii) For control of nursery insect pests any one of the following insecticides is to be sprayed as and when necessary. Generally an insecticidal spray at 5-7 days after sowing is effective against most pests.

Insecticide	**Dose**
Imidacloprid 70WG	24.5g *a.i.*/ha or 0.3g/lit
Thiamethoxam 25WG	25g *a.i.*/ha or 0.3 g/lit
Fipronil 5SC	50g *a.i.*/ha or 1.5-2ml/lit

High volume spray: 40 ml of water/sq. m

Low volume spray: 13 ml of water/sq. m

Field Preparation:

1. One ploughing should be given at least 21 days prior to transplanting. An irrigation for land soaking should be applied before preparatory tillage.
2. Secondary irrigation should be applied at 10-12 days prior to transplanting followed by ploughing, laddering and puddling, accompanied by repairing and mud plastering of bunds. Thereafter, another irrigation should be applied for land submergence.
3. The final puddling should be done 4-5 days prior to transplanting. One irrigation should be applied before final puddling (depth of each irrigation: 5-7 cm).

Manures and Fertilizers:

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
Semi dwarf varieties:				
N	40	Urea	88	12
P_2O_5	20	SSP	125	17
K_2O	20	MOP	32	4

Above rates of nutrients will be valid for most of the rice growing areas of Assam. In case of poor soil, the rates of nutrients may be raised to the extent of 60 : 30 : 30 kg/ha N, P_2O_5 and K_2O respectively. Granulated mixed fertilizers at appropriate doses can also be applied. Di-Ammonium Phosphate (DAP) in combination with rock phosphate or alone at the recommended level of nutrients (40 : 20 : 20) can be applied as a substitute for SSP and MRP or their combinations as an economic source of phosphate.

Time of application of fertilizers:

i) Only 1/3rd of the total urea, full doses of super phosphate and potash at the time of final puddling should be applied.

i) The second 1/3rd and third 1/3rd doses of urea should be applied at tillering and panicle initiation stages respectively. Top dressing of urea should be preceded by weeding.

ii) Super phosphate can also be incorporated into the soil at the active tillering stage (25-35 days after transplanting) along with the second dose of nitrogenous fertilizer.

Use of Azolla to supplement nitrogenous fertilizers:

Azolla can be used as supplement to nitrogenous fertilizers. About 300 kg fresh Azolla/ha is to be inoculated in the main field, pounded with 5-10 cm depth of water for about 2-3 weeks prior to final puddling. At the time of inoculation, super phosphate @ 8-10 kg/ha is to be applied in the field. Thereby, the corresponding quantities of phosphatic fertilizer should be reduced at the time of transplanting. Fresh Azolla @ 500 kg may also be applied in the standing water in a transplanted crop after the establishment of the seedling. There is no need for application of additional phosphatic fertilizer in the field at the time of inoculation with fresh Azolla after transplanting. Thereafter, Azolla will multiply 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 for two weeks.

Natural depression and ponds or tanks may be used for Azolla multiplication outside the main field and may be incorporated at the time of land preparation @ 6 t/ha of freshAzolla.

Nitrogen dose can even be reduced up to 50% when Azolla is applied and incorporated in the field.

Use of Biofertilizer:

Application of organic manure @ 1 t/ha (on dry weight basis) along with mixed inoculum of *Azospirillum amazonense* A-10 and *Bacillus megaterium* P-5 @ 4 kg/ha (0.4-0.5 kg/bigha), rock phosphate @ 10 kg P_2O_5per ha (rock phosphate 56 kg/ha or 7.5 kg/bigha) and muriate of potash @ 40 kg K_2O per ha (muriate of potash 67 kg/ha or 9 kg/bigha) is recommended for rice in rice-rice, rice-legume-rice and sole rice sequences.

Method of application of Biofertilizer:

A. Technique of application of the components if the INM package for transplanted rice:

Application of the organic manure and fertilizer component: The required quantity of compost (approx. 1.5 q or 2 bullock cart load per bigha should be applied at least a week before transplanting or at the time of final ploughing. Required quantity of potassium (40 kg K_2O per ha or 5.5 kg per bigha) should be applied prior to transplanting. Rock phosphate component is used along with the biofertilizer as slurry to treat the seedling roots.

B. Treatment of rice seedling roots with the biofertilizer component and rock phosphate by slurry method:

Prepare a pit in the corner of a plot in the morning of the transplanting day by simply raising a bund that touches the two already existing bunds to obtain a triangular shape. The size of the pit should be proportionate to place the quantity of seedlings required for a bigha of land. Excess water from the pit should be removed so that only mud remains. Now add 10 kg of dried compost to the required quantity of rock phosphate, and mix with mud and then add the biofertilizer. The mixture of the mud, compost, rock phosphate and biofertilizer should form uniform slurry. The rice seedling roots in the bundles should be free of adhered soil and dipped in the slurry mixture and kept for two hours. During the two hours time, the biofertilizer and rock phosphate adhere well to the seedling roots. Then remove the seedling bundles from the pit and keep on the raised bund. Care should be taken so that the seedlings are not swept in water of the plot as the Assamese farm women are habituated in occasional sweeping of the seedlings during transplanting. The biofertilizer on the root surface keep multiplying as the root grows bigger and by 20/30 days time they start supplying N, hormone and also soluble P to the roots in adequate quantity.

Time of transplanting:

Transplanting should be done during April-May.

Transplanting:

Transplanting should be done with 3 seedlings per hill. Spacings should be 20 × 15 cm (33 hills /sq.m) for semi-dwarf and 20 × 20 cm (25 hills/sq.m) for tall traditional varieties.

The wooden line marker of required spacing may be used for the same purpose. The depth of planting should be 4-5 cm.

Gap-filling:

Replanting of dead hills should be done within 7-10 days of transplanting with seedlings of same age.

Water management:

Application of 5 cm irrigation water 3 days after disappearance of ponded water is recommended in medium and heavy soils.

Interculture:

Preferably two weedings at 20 and 40 days after transplanting should be done. Alternatively weeder can be used at the time of top dressing of nitrogenous fertilizer.

Plant protection Measures in the field:

A) Insect Pests:

Plant protection measures should be adopted against insect pests at their economic threshold level 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) Root-knot nematode:

Apply, *Pseudomonas flourescens* @ 20g / sq. m at the time of sowing

C) Diseases: Same as in direct seeded *ahu*.

Pre-harvest treatment should be undertaken on standing crop for better grain quality (Same as in direct seeded normal ahu).