

**Agriculture Department**  
**MISING AUTONOMOUS COUNCIL**

**Project Report**

**Demonstrative Boro Rice Cultivation Complete with Boring and  
Installation of Pump Set with Technical assistance from KVK, Dhemaji.**

**Financial Year 2014-15**

**Amount: Rs. 36.48 Lakhs**

**Area: (96 Ha)**

**Introduction:**

The Mising Autonomous Council area with 70% Scheduled Tribe population is one of the most backward and flood devastated areas of Assam. The people once lived as free people with their own traditional agricultural practice and way of life. But, the recurring flood and erosion since the great earthquake of 1950 has changed the geo-morphology of the area so much that livelihood with old traditional practices have become unsustainable. Poverty and unemployment are ubiquitous in every flood affected village of the area today.

Flood is a natural phenomenon that occurs every year and people have adapted themselves to a great extent over long years of inhabiting in floodplains – like constructing stilt house, using boats for communication etc. But, people are failing to cope with acute shrinkage of arable land as per traditional practice and frequent crop damage by flood.

The situation can be changed, with collective efforts, by introducing boro rice cultivation (Nov/Dec to May/June) which is a safer period from flood.

**Objective:**

The traditional agriculture practice of majority tribal people of MAC area is winter rice (June/July to November/December) and ahu or autumn rice (March/April to June/July). There are large low lying areas in MAC which are suitable for Boro rice cultivation. But Boro or summer rice (November/December to May/June) is completely unknown except in a few pockets of irregular practice. Boro and ahu rice cultivation are free from flood threats and therefore, if introduced in large scale, can replace Sali crop and thereby solve the long standing problem of the main crop being damaged by flood. But, this requires social mobilisation, change of culture and practice, capacity building and providing irrigation facilities etc.

Therefore, this project proposes to demonstrate Boro Rice cultivation with active participation of farmers and technical guidance by Krishi Vigyan Kendra and State Agriculture department in select places.

## Package of Practice of BORO Rice

### Varieties:-

Variety	Sowing time	Planting time	Harvesting Time	Duration <sup>1</sup> (Days)	# <sup>2</sup> Agro climatic Zone	Average Yield (t/ha)
Boro1	Nov	Dec/Jan	Apr/may	150	N.U.C.L.B	3.0
Boro2	Nov	Dec/Jan	May	165	N.U.C.L.B	3.0
Culture 1	Nov	Dec/Jan	Mid/Apr	140-145	N.L.B	2.0
Kalinga 3	Nov	Dec/Jan	Mid/Apr	175	U.L	3.0
Krishna	Nov	Dec/Jan	Apr	145-155	B	3.5
Mahsuri <sup>3</sup>	Oct	Nov/Dec	May	180-190	N.U.C.L	4.0
IR-50	Nov/Dec	Dec/Jan	Apr/May	155-160	C.B	3.0
Cauvery	Nov/Dec	Dec/Jan	Apr/May	150-155	B	3.0
Banglami	Nov/Dec	Dec/Jan	Apr/May	155-160	B	3.5
Joymati	Nov/Dec	Dec/Jan	May/Jun	175	C.L	5.1
Bishnuprasad	Nov/Dec	Dec/Jan	Apr	165	All Zones	4.5
Jyotiprasad	Nov/Dec	Dec/Jan	Apr	165	All Zones	4.5

### Newly recommended varieties:

Variety	Sowing time	Planting time	Harvesting Time	Duration (Days)	#Agro climatic Zone	Average Yield (t/ha)	Disease reaction
Dinanath	Nov	Dec/Jan	Apr/May	160-165	N.U.C L.B	6.28	MR to blast & sheath blight
Swarnabh	Nov	Dec/Jan	Apr/May	160-165	N.U.C L.B	6.16	R to blast & MR to sheath blight.
Kanaklataa	Dec	Jan/Feb	May/Jun	165-175	U.C.L B	5.0-5.5	T to BLB & sheath blight MS to blast & sheath rot.

**Land selection:** Low-lying typical Boro areas or irrigation command areas are to be selected.

**Seed Selection:** Seeds are to be put in plain water and the healthy seeds are to be selected.

### **Seed treatment with chemicals**

**(a) Wet Method:** After selection, the seeds are to be soaked directly in any one of the following fungicidal suspensions for 24 hrs.

Fungicide	Concentration (g/lit of water)	Cost of fungicide to treat seeds required for one ha
Mancozeb	2.5	Rs. 34.00

<sup>1</sup> Durations of the varieties are based on experiments at RARS, Titabar. In areas with slightly higher winter temperature the duration will be shortened.

<sup>2</sup> Refer to the page with abbreviations.

<sup>3</sup> Not recommended for blast endemic areas

Captan	2.5	Rs. 40.00
Carbendazim	1.0	Rs. 56.00

One liter fungicidal solution is required to treat one kg of seed.

Seed selection in water Fungicidal -> 24 hrs. Incubation for -> 48 hrs

- (b) **Dry method:** Seeds and any one of the following fungicides are to be put in a closed container and then agitated for five minutes for through mixing.

Fungicide	Concentration (g/lit of water)	Cost of fungicide to treat seeds required for one ha
Mancozeb	2.5	Rs. 34.00
Captan	2.5	Rs. 40.00
Carbendazim	1.0	Rs. 56.00

### **Raising of seedling**

#### **(a) Seed bed preparation:**

Flat seed bed is recommended. Beds should be 125 cm wide and 10 m long with 30 cm gap in between two beds. Six to eight such beds are required for transplanting 1 bigha. Low poly-tunnel (height: 75cm, width: 125cm, length: as per convenience) should be used for raising seedlings during cold period (end of December to mid-January). Poly-tunnel is a portable structure constructed with polythene sheet fixed on to a frame made of bamboo sticks. The structure is placed over seedling on the seed bed to ensure favorable temperature for the growing seedlings. Any gap between the poly-tunnel and the soil should be sealed with mud to maintain warmth inside the tunnel during night. The structure should be removed for 1-2 hrs daily, starting from the 7<sup>th</sup> day before uprooting in order to allow the seedling to acclimatize. The duration of removal should be increased gradually and the seedlings should finally be kept completely exposed for about 2 days.

#### **(b) Seed rate**

Pre-germinated seeds are to be sown @ 650-1000 gram per bed. Seed requirement for transplanting one ha of main field is 40-45kg.

#### **(c) Plant protection in seed bed**

- Spraying with carbendazim @ 1 gm/lit of water or ediphenphos 1 @ 1 ml/lit of water is to be done as soon as one-two blast spots are seen.
- In root-knot nematode and stem borer endemic areas, carbofuran granules @ 3 g/sq.m or phorate @ 1 g/sq.m or DIAZINON @ 1g/sq.m is to be applied after 5 days of sowing.

In case, nematode is not a problem any one of the following schedule is followed for control of nursery insect pests as and when necessary. Generally an insecticidal spray at 5 to 7 days after sowing is effective against most pests.

Insecticide	Dosage (ml/10 sq.m)
Chlorpyrifos	0.10
Quinalphos	0.15
Monocrotophos	0.12
Phosphamidon	0.07

Endosulfan	0.14
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High volume spray: 400 ml of water/10 sq.m. Low volume spray: 100 ml of water/10 sq.m

**(d) Preparation of seedlings for initial protection in the main field**

After washing the roots of the uprooted seedlings the root portion is to be dipped in 0.02% solution of chlorpyrifos (1ml/lit of water) along with 1% urea for 3 hrs. as a protective measure against stem borer, gall midge and hoppers.

Iteratively, either carbofuran @ 3g/sq.m or phorate 1g/sq.m may be applied in the seed bed 5 to 7 days before uprooting of seedlings, or chlorpyrifos 0.05% may be sprayed in the nursery bed before uprooting of seedlings.

**(e) Age of seedlings**

5-6 leaf stage is suitable for planting.

**Field preparation**

The field should be ploughed 3-4 times followed by laddering. Leveling should be done properly to retain water uniformly in the field.

**Fertility Management**

Land situation requirement	Nutrient requirement (kg/ha)			Fertilizer (kg/bigha)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Urea	SSP	MOP
Low lying area	0	0	0	0	0	0
Periphery of low-lying area	40	20	20	12	18	4
Irrigated area	60	30	30	18	27	6

N.B. For Barak Valley Zone and Central Brahmaputra Valley Zone, in the periphery of low lying area NPK dose of 20 : 10 : 10 Kg/ha ( 5 Kg urea, 9 Kg SSP and 2 kg MOP/bigha is recommended).

**Time of application**

In marshy areas whole of super phosphate and murat of potash is to be applied and entire quantity of urea is being top dressed after 21-25 days of transplanting. For irrigated area. 1/3<sup>rd</sup> urea as basal and 1/3<sup>rd</sup> at the time of tillering and the remaining part at panicle initiation stage are to be applied. Super phosphate can also be incorporated into the soil at active tillering stage 25-35 days after transplanting along with second dose of N.

**Transplanting**

Variety	No of seedling per hill for marshy area	Depth of planting (cm)	Spacing row X plant(cm)
Mahsuri, Boro-1	2	5	25x20
Boro -2			
Kalinga-2	2	5	20x20
Krishna			
Culture-1 (Kalinga 3)	3	5	20x20

### **Gap filling**

The dead hills are to be replanted within 7-10 days of transplanting.

### **Water management**

Irrigation water is to be applied to maintain  $5 \pm 2$  cm of standing water in the field after 2-3 days of transplanting up to 7-10 days before harvest. But under constrained availability of water, 7cm irrigation water may be applied one day after disappearance of ponded water.

### **Interculture**

Two weedings are to be given preferably at 20 and 40 days after transplanting. Weeder can also be used after top dressing to incorporate the nitrogenous fertilizer with the soil.

Pre-emergence application of pretilachor 0.75kg a.i./ha or butachlor 1.0kg a.i./ha followed by rotary paddy weeder at 40 days after transplanting.

### **Plant protection**

#### **Insect pests**

Plant protection measures to be adopted against insect pests at their Economic Threshold Levels (ETLs) are given in the table 1.

#### **Diseases**

Blast: As soon as one or two spots on leaf are seen the following spraying schedule is to be followed immediately.

Fungicide	Concentration
Ediphenphos	0.1% (1ml/lit)
Mancozeb	0.2% (2g/lit)
Cu-oxycloride	0.4% (4g/lit)
Thiophanatemethyle	0.1% (1g/lit)
Carbendazim	0.1% (1g/lit)

Volume of spray solution required is 525-750 Lit/ha.

Spraying is repeated at 10-15 days intervals till the disease is controlled.

#### **Sheath blight**

For control of this disease carbendazim @ 0.05% (0.5 g/lit) or hexaconazole (2ml/lit) @ 525-750 lit of spray solution/ha is to be sprayed. Two sprays are required, the first at the appearance of the disease and another 10 days after the first spraying.

## Package of Practice: Hybrid Boro rice

### Varieties

Variety	Duration (days)	Yield (t/ha)
Pro Agro 6444	170-175	7.5
DRRH 1	165-170	7.1
KRH 2	175-180	6.0

**Land Selection:** Areas with assured irrigation facilities are to be selected.

### Seed Treatment

- a) **Wet method:** Seeds are to be soaked directly in any one of the following fungicidal suspensions for 24 hours.

Fungicide	Concentration (g/lit of water)
Mancozeb	2.5
Captaf	2.5
Captafol	2.5
Carbendazim	1.0

- b) **Dry method:** Seeds and one of the following fungicides are to be put in a closed container and agitated for five minutes for thorough mixing.

Fungicide	Concentration (g/lit of water)
Mancozeb	2.5
Captaf	2.5
Captafol	2.5
Carbendazim	1.0

### Raising of seedlings

**Seed bed preparation:** Flat seed bed with 1.25m width, 10.0m length and 30cm gap between two beds is to be prepared. Land is to be thoroughly puddled.

**Seed rate:** Pre-germinated seeds are to be sown @ 250-300 g/bed. Seed requirement for transplanting one hectare of main field is 7.5kg.

**Manures and fertilizers:** 20-30kg FYM or compost, 80g urea, 80g SSP and 40g MOP are to be applied in each bed.

**Sowing time:** 15-30 November.

**Water management:** Standing water in the furrows between beds is to be kept to maintain saturated condition in the seed beds. Irrigation up to submergence of beds before uprooting of seedlings facilitates the process.

**Plant protection:** Same as boro rice.

**Preparation of seedling for initial protection in the main field:** After washing of roots of the uprooted seedlings, the root portion is to be dipped in 0.02% solution of chlorpyrifos (1ml/lit

of water) along with 1% urea for 3 hours as a protective measure against stem borer, gall midge and hoppers.

**Age of seedling:** 45 days old seedling (5-6 leaf stage)

**Main field preparation:**

1. The field should be ploughed properly and levelled to retain water uniformly in the field.
2. The irrigation for soaking the land is to be applied before preparatory tillage. 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 for land submergence.
3. The final puddling is to be done just before transplanting. One irrigation is to be applied before final puddling.

**Fertility management**

Nutrient	Requirement (kg/ha)	Form	Fertilizer requirement	
			Kg/bigha	Kg/ha
N	100	Urea	217	29
P <sub>2</sub> O <sub>5</sub>	60	SSP	375	50
K <sub>2</sub> O	60	MOP	100	13

**Time of application of fertilizer:** One fourth of the total urea, full doses of SSP and MOP at the time of final puddling are to be applied as basal dressing. The 2<sup>nd</sup> one fourth, 3<sup>rd</sup> one fourth and 4<sup>th</sup> one fourth of urea are to be applied as top dressing and incorporated with soil at maximum tillering, panicle initiation and booting stages, respectively.

**Spacing:** 20cm X 15cm (33hills/sq.m)

**No. seedlings per hill:** 1 (one)

**Depth of planting:** 5cm

**Gap filling:** The dead hills are to be transplanted within 7-10days of transplanting.

**Water management:** Irrigation water is to be applied at a depth of 5cm 3 days after disappearance of ponded water from transplanting.

**Intercultural operation:** Two weedings are to be given at 3-4 weeks and 6-7 weeks after transplanting. Paddy weeder can be used after top dressing to incorporate the nitrogenous fertilizer with soil.

**Plant protection:** Plant protection against insects pests and diseases are same as boro rice.

## Estimate for Demonstrative Boro Paddy Cultivation

Area: 1.00 ha (7.5 bighas)

### Financial requirement (For 1 ha)

Sl. No.	Item	Quantity	Rate (Rs)	Amount (Rs)	Share
<b>A</b>	<b>Cost of Input</b>				
1	Seed	40 kg	33	1320.00	MAC
2	Ploughing for seed bed	3 times	225	675.00	Farmer
3	Main field preparation	4 times	1800	9000.00	Farmer
4	Fertilizers				
a.	Urea	37.5	10.5	393.75	MAC
b.	SSP	67.5	13	877.50	MAC
c.	MOP	15	23	345.00	MAC
5	Pesticide	L/S		800.00	MAC
<b>B</b>	<b>Capacity Building Training</b>				
	• Trainee's material	100	20	2000.00	KVK
	• Resource person	2	1000	2000.00	KVK
	• Arrangement	□		2000.00	Farmer
	• Tea cum meal	100	50	5000.00	KVK
2	Field day cum harvesting	LS		5000.00	Farmer
<b>C</b>	<b>Monitoring</b>				
	• POL	□		1500.00	MAC
<b>D</b>	<b>Facilities</b>				
1	Sign board (5x3)ft	15 sq. ft	100.00	1500.00	MAC
2	Cost of one 5 HP Diesel Pump set	1 (One)	30500	30500.00	MAC
	Cost of boring			8000.00	Farmer
	<b>Grand total</b>			70911.25	
E	Contingency @ 1%			709.11	MAC
	<b>Total</b>			<b>71620.36</b>	
	<b>Farmer's share (Rs.)</b>			24675.00	
	<b>KVK's share (Rs.)</b>			9000.00	
	<b>MAC's share (Rs.)</b>			38000.00	
	<b>Total Project cost for 96 Hectare:</b>			6807480.00	
	<b>Total cost share by MAC for 96 Hectare:</b>			3648000.00	

(Rupees Thirty Six Lakhs Forty Eight thousand only )

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