Soil of Andaman and Nicobar Islands

The soil type of Andaman and Nicobar Islands ranges from sandy clay to sandy loam. These have developed under the dominant influence of vegetation and climate over diverse parent material. The uplands under forest cover are intensely leached, but runoff is very high, wherever forest cover has been removed completely. The valley floors comprise of depositional landforms and have been termed as low lands and have developed from the out wash of parent material from the surrounding hills. These soils are medium to heavy textured and moderately well drained and subjected to seasonal fluctuations in ground water. Most of the soils of these islands have medium to high organic matter status indicating that the organic carbon is >0.5%. Parts of south and middle Andaman has low organic carbon status mainly because of severe erosion of the surface soil caused due to extensive deforestation and complete neglect of the deforested area. In general, soil fertility analysis indicates medium in available N, low in both available P and K.

Major limitation of different soils

Soil series	**Area(000'ha)**	**Major limitations**
School line	7	Moderate erosion hazards, low base exchange.
Calicut	20	Serious erosional hazards.
Garacharma	20	Top soils are lost, low nutrient status.
Dhanikhari	1	Salinity and low pH. Acid sulphate soils. Toxicity of Al and Fe, low P supplying capacity.
Rangachang	26	Coarse textured soils, low nutrient supplying capacity, low water holding capacity.
Tushnabad	7	Poor drainage. Heavy texture.
Munda pahar	3	Moderate to heavy erosional hazards due to moderate
Wandoor	19	Steep slopes
Austinabad	17	
Phargaon	7	Erosion hazards due to moderate slopes.
Little Andaman	5	Erosion hazards due to undulating nature, medium to low water and nutrient holding capacity.

Package of Practices for Rice under Normal and Problem soils of Bay Islands

Sl. No.	Practices	Normal Soil			Problem soils			
		Transplanted	Direct wet seeded	'SRI'	Saline / Sodic soil	Acid sulphate soil	Fe toxic soils	Al toxic soils
1.	Condition of soil	pH 6.5 to 7.5, EC <3 dsm^{-1}	pH 6.5 to 7.5, EC <3 dsm^{-1}	pH 6.5 to 7.5, EC <3 dsm^{-1}	Saline: pH <8.5, EC > 4.0 & ESP < 15 % ; Sodic: pH > 8.5, EC < 4, ESP > 15 %, SAR >15	pH <5.5	pH < 5.0	pH <5.5, Al: >1-2 mg / l of soil solution, Al saturation > 30 %
2.	Symptoms	-	-	-	White tips in leaves, Chlorotic patches, stunting, reduced tillering, patchy field growth	Orange yellow to white interveinal chlorosis, poor & stunted growth, yellow to white mottling, stunted and deformed roots.	Lower leaves with tiny brown spots, narrow leaves, leaf tips become orange to yellow, stunted growth, black roots, extremely limited tillering.	Orange yellow to white interveinal chlorosis, poor & stunted growth, yellow to white mottling, stunted and deformed roots.

2.	Nursery							
	Seed bed preparation	Wet or dry bed method	-	MAT method (5 cm raised bed)	Wet or dry bed method	Wet or dry bed method	Wet or dry bed method	Wet or dry bed method
	FYM	1 t	-	125 kg	1 t	1 t	1 t	1 t
	Nursery area /ha	800 m^2	-	100 m^2 (20 frames of 1 X 5 m)	800 m^2	800 m^2	800 m^2	800 m^2
	Varieties	C14-8, Taichung-sen-yu, Quing livan No. 1, Jaya, Ponni	C14-8, Taichung-sen-yu, Quing livan No. 1	Taichung-sen-yu	BTS 24, BTS 28, CSR 10, IR 6, TRY (R) 2, CO 47, ADT 43, ADT 36, CO 43, TRY 1	IR 43, Co 37, Basmati 370	Mahsuri, IR 8192-200, IR 9764-45	IR 43, Co 37, Basmati 370
	Seed rate (kg / ha)	60, 40 & 30 kg ha^{-1} for short, medium and long duration varieties respectively	45-50 kg /ha	7.5 kg ha^{-1} (375 g for 1 X 5 m frame)	70, 50 & 40 kg ha^{-1} for short, medium and long duration varieties respectively	70, 50 & 40 kg ha^{-1} for short, medium and long duration varieties respectively	70, 50 & 40 kg ha^{-1} for short, medium and long duration varieties respectively	70, 50 & 40 kg ha^{-1} for short, medium and long duration varieties respectively
	Seed dipping with 1 % Na cl	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds	Dip dry seeds with 1 % Na cl and remove floating seeds
	Seed treatment with fungicides	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed	2g carbendazim or tricyclozole /kg of seed

	Seed treatment with Bio fertilizers	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*	10 g *Pseudomonas fluroscens* / kg of seeds + 3 packets of *Azospirillum*
	Pregerminated seeds	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs	Soak the seeds in water for 12 hrs and keep it under dark for 24 hrs
	DAP	20 kg for 800 m^2	-	1.9 kg for 100 m^2	20 kg for 800 m^2	20 kg for 800 m^2	20 kg for 800 m^2	20 kg for 800 m^2
	If N deficiency arises	Apply 500 g urea / cent at 7-10 days prior to pulling	-	Spray 0.5 % urea after 7 days, if seedlings are stunted	Apply 500 g urea / cent at 7-10 days prior to pulling	Apply 500 g urea / cent at 7-10 days prior to pulling	Apply 500 g urea / cent at 7-10 days prior to pulling	Apply 500 g urea / cent at 7-10 days prior to pulling
	Water management	Field capacity	-	Rose cane water spray	Field capacity	Field capacity	Field capacity	Field capacity
	Weed management	Hand weeding	-	Hand weeding	Hand weeding	Hand weeding	Hand weeding	Hand weeding
	Age of seedlings	18-22, 25-30 & 35 – 40 days old for short, medium and long duration respectively	-	13 – 15 days	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively + delayed planting	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively + delayed planting	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively + delayed planting
3.	Main field preparation							

	Green manure incorporation	Incorporate 6.25 t ha^{-1} 7 days prior to planting.	Not required	Incorporate 6.25 t ha^{-1} 7 days prior to planting.	Incorporate 6.25 t ha^{-1} 7 days prior to planting.	-	Incorporate 6.25 t ha^{-1} 7 days prior to planting.	-
	Ploughing	Twice with country plough	Twice with country plough	Twice with country plough	Submergence of fields for 2-4 weeks before planting, leaching of salts with intermittent submergence, prevent fresh intrusion of sea water by repairing dykes/sluice gates, Twice with country plow	Twice with country plough	Avoid continuous flooding, dry tillage after rice harvest to enhance iron oxidation, Twice with country plough	Twice with country plough
	Cage wheeling	Twice if ploughing not done	Twice if ploughing not done	Twice if ploughing not done	Twice if ploughing not done	Twice if ploughing not done	Twice if ploughing not done	Twice if ploughing not done
	FYM application	12.5 t /ha	12.5 t /ha	12.5 t /ha	12.5 t /ha + recycle rice straw	-	12.5 t /ha	-
	Basal application of fertilizers	50 % N, 100 % P & 50 % K	100 % P & 50 % K	-	50 % N, 100 % P & 50 % K + 37.5 kg of $ZnSo_4$ mixed with sand of	50 % N, 100 % P & 50 % K + Lime 2.5 t ha^{-1}	50 % N, 100 % P & 50 % K + Lime 2.5 t ha^{-1} (Incorporate	50 % N, 100 % P & 50 % K+ Lime 2.5 t ha^{-1}

					equal quantity. If pH is < 8.5, apply 1.25 t of gypsum /ha. If pH is 8.5 – 9.0, apply 2.5 t /ha of gypsum. For pH of >9.0, 1 t of gypsum / ha for each unit increase in pH.		lime on top soil)	
	Levelling	Normal	Should be perfect	Should be perfect	Should be perfect	Should be perfect	Should be perfect	Should be perfect
4.	Transplanting/wet seeding							
	Age of seedlings	18-22, 25-30 & 35 – 40 days old for short, medium and long duration respectively	-	13 – 15 days	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively	25-27, 32-37 & 42 – 47 days old for short, medium and long duration respectively
	Seedlings treatment	If possible treat seedlings with 6 packets of *Azospirillum*	-	If possible treat seedlings with 6 packets of *Azospirillum*	If possible treat seedlings with 6 packets of *Azospirillum*	If possible treat seedlings with 6 packets of *Azospirillum*	If possible treat seedlings with 6 packets of *Azospirillum*	If possible treat seedlings with 6 packets of *Azospirillum*
	Number of seedlings	2-3	-	1	4-6	4-6	4-6	4-6
	Spacing	15 X 10 cm, 20 X 10 cm	25 cm	25 X 25 cm	15 X 10 cm, 20 X 10 cm	15 X 10 cm, 20 X 10 cm	15 X 10 cm, 20 X 10 cm	15 X 10 cm, 20 X 10 cm

		and 20 X 15 cm for short, medium and long duration varieties.			and 20 X 15 cm for short, medium and long duration varieties.	and 20 X 15 cm for short, medium and long duration varieties.	and 20 X 15 cm for short, medium and long duration varieties.	and 20 X 15 cm for short, medium and long duration varieties.
	No. of hills /m^2	80, 50, 33 for short, medium and long duration varieties	-	16	80, 50, 33 for short, medium and long duration varieties	80, 50, 33 for short, medium and long duration varieties	80, 50, 33 for short, medium and long duration varieties	80, 50, 33 for short, medium and long duration varieties
	Depth of planting	3 cm	-	2 – 3 cm	3 cm	3 cm	3 cm	3 cm
	Gap filling	7 – 10 days after transplanting	7 – 10 days after sowing	7 – 10 days after transplanting	7 – 10 days after transplanting	7 – 10 days after transplanting	7 – 10 days after transplanting	7 – 10 days after transplanting
	Intercropping of green manures	-	*Sesbania aculaeta* in 1:1 ratio using Rice + *dhaincha* seeder	-	-	-	-	-
5.	Water management							
	Up to 15 days	Shallow water level of < 2 cm hence provide drainage channels all around the field	Shallow water level of < 2 cm hence provide drainage channels all around the field	Shallow water level of < 2 cm hence provide drainage channels all around the field	water level of 5 cm hence provide bunding & drainage channels all around the field. Intermittent submergence	Shallow water level of < 2 cm hence provide drainage channels all around the field	Shallow water level of < 2 cm hence provide drainage channels all around the field. If possible store water in the	Prevent top soil from drying, sufficient water stagnation, proper bunding, Provide drainage

					is more important for leaching of salts.		field intermittently.	channels all around the field
	15 - flowering	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	Shallow water hence drainage channels all around field are necessary	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water
	Flowering - harvest	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	Shallow water hence drainage channels all around field are necessary	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water	5 cm of water hence raise the bunds of the field to hold the water
6.	Nutrient Management							
	Blanket dose	90:40:60 kg NPK ha^{-1}	90:40:60 kg NPK ha^{-1}	Normally does not require any nutrients, however LCC based application can be done.	120:40:60 kg NPK ha^{-1} Foliar spraying of 2 % DAP, 1 % urea & 1 % K at panicle initiation and 15 days after (2 sprays)	90:40:60 kg NPK ha^{-1}	90:40:60 kg NPK ha^{-1} Additional P, K & mg fertilization	90:40:60 kg NPK ha^{-1}
	Micro/other nutrients	-	-	-	5- 10 kg of $ZnSo_4$ / ha	-	-	-
	Source of application	Urea, SSP, MOP	Urea, SSP, MOP	-	N as Ammonium sulphate, rock	Urea, SSP, MOP	Urea, SSP, MOP	Dolomite is better than lime. Kiaserite

					phosphate and MOP			& langbinite (50 kg ha^{-1}), recycle paddy straw/ash to replenish si, reactive rock phosphate @ 1 t ha^{-1}

	Method of application	Basal incorporation and top dressing	Basal incorporation and top dressing	-	Basal incorporation and top dressing	Basal incorporation and top dressing	Basal incorporation and top dressing	Basal incorporation and top dressing
	Time of application	Basal, active tillering, panicle initiation & heading	Active tillering, panicle initiation & heading	-	Basal, active tillering, panicle initiation & heading	Basal, active tillering, panicle initiation & heading	Basal, active tillering, panicle initiation & heading	Basal, active tillering, panicle initiation & heading
7.	Weed Management							
	Critical period	Up to 50 days after transplanting	Up to 55 days after sowing	Up to 55 days after transplanting	Up to 50 days after transplanting	Up to 50 days after transplanting	Up to 50 days after transplanting	Up to 50 days after transplanting
	Time of weeding	20-22 & 43 – 45 days (twice) after transplanting	20, 35 & 50 days after sowing	Cross cono weeding on 10 –12, 20-22, 30-32, 40-42 (4 times) days after transplanting	20-22 & 43 – 45 days (twice) after transplanting	20-22 & 43 – 45 days (twice) after transplanting	20-22 & 43 – 45 days (twice) after transplanting	20-22 & 43 – 45 days (twice) after transplanting
	Cultural	-	Intercropping *dhaincha* and incorporating	-	-	-	-	-

			using conoweeder					
	Mechanical / Manual	Twice either hand weeding or conoweeding	Hand weeding at 20 DAS & cono weeding at 35 & 50 DAS	Cross conoweeding	Twice either hand weeding or conoweeding	Twice either hand weeding or conoweeding	Twice either hand weeding or conoweeding	Twice either hand weeding or conoweeding
8.	Pest Management							
	Stem borer	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting	-	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting	*Trichogramma japanicum* @ 5 ml ha^{-1} at weekly interval or *T.chilonis* at 37, 44 & 51 days after transplanting
9.	Disease Management							
	Sheath blight	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting	-	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting	*Pseudomonas `fluroscens* @ 2.5 kg ha^{-1} at 30 days after transplanting
	Brown spot	Mancozeb 1kg ha^{-1}	Mancozeb 1kg ha^{-1}	-	Mancozeb 1kg ha^{-1}	Mancozeb 1kg ha^{-1}	Mancozeb 1kg ha^{-1}	Mancozeb 1kg ha^{-1}
10.	Harvest							
	Method of harvest	Manual / mechanical	Manual / mechanical	Manual / mechanical	Manual / mechanical	Manual / mechanical	Manual / mechanical	Manual / mechanical
	Threshing	mechanical	mechanical	mechanical	mechanical	mechanical	mechanical	mechanical
	Drying	12 % moisture	12 % moisture	12 % moisture	12 % moisture	12 % moisture	12 % moisture	12 % moisture