


















S. No	Diseases	Damage	Control	Reference
1	Rice Blast	<ul style="list-style-type: none"> <li>Appearance of small greyish, bluish or whitish spots on the affected area</li> <li>Grain development is affected and the panicles droop</li> </ul>	<ul style="list-style-type: none"> <li>Use of healthy seeds and seed treatment with fungicide (azoxystrobin) @ 10g/4kg of seeds</li> <li>Pulling out and burning the diseased plants</li> <li>Use of systematic fungicide (3% of hexaconazole) at weekly intervals starting from booting stage</li> </ul>	
2	Sheath Blight	<ul style="list-style-type: none"> <li>Alternate narrow bands of reddish-brown or brown with white bands of greenish grey appear at the base of leaf blade</li> </ul>	<ul style="list-style-type: none"> <li>Seed treatment with fungicide such as azoxystrobin @ 10g/4kg of seeds</li> <li>Split application of Urea and use of slow-release nitrogen such as neem coated Urea</li> </ul>	
3	Seedling Blight (Damping off)	<ul style="list-style-type: none"> <li>The fungi penetrate and infest the undeveloped seedling which dies out suddenly after emergence</li> <li>Brown thin and irregular spots on growing point or coleoptile of rice plant</li> </ul>	<ul style="list-style-type: none"> <li>Seed dressing with Imidacloprid 20% @ 10g/4kg of Seeds</li> <li>Foliar application of Azoxystrobin @ 400g/Ha (20g/15L knapsack sprayer)</li> </ul>	
4	Brown Spot	<ul style="list-style-type: none"> <li>Brown lesions having a yellow halo appeared on leaves.</li> <li>The brown spot cause severe damage and ultimately leaf dies.</li> </ul>	<ul style="list-style-type: none"> <li>Avoidance of water stress in field reduce the propagation of the disease</li> <li>Use of Azoxystrobin + Difenconazole @ 500ml/Ha (20ml/15L knapsack sprayer)</li> </ul>	
5	Bacterial Leaf Blight	<ul style="list-style-type: none"> <li>Elongated lesion at the tip of leaves or edges</li> <li>Leaf tips and edges turn firstly into white, then yellow and finally grey color</li> <li>The crop dies and the grains remain empty</li> </ul>	<ul style="list-style-type: none"> <li>Sowing of resistance varieties</li> <li>Split application of Nitrogen and use of slow-release nitrogenous fertilizers</li> <li>Use of Mancozeb + Carbendazim @ 250g/Ha (25g/15L knapsack sprayer)</li> </ul>	

S. No	Pest	Damage	Control	Reference
1	Stem Borer	<ul style="list-style-type: none"> <li>Affect rice at vegetative stage</li> <li>Hatchlings bore &amp; feed in the leaf sheath</li> <li>Leaf whorl turns tannish while the lower leaves remain green</li> <li>Infected tillers dry-off without panicles</li> </ul>	<ul style="list-style-type: none"> <li>Root dipping prior to transplanting in 0.02% Chlorpyrifos for 12 hours</li> <li>Repeated (at least 2) foliar application of Chlorpyrifos @ 0.5 kg a.i/ha at vegetative stage</li> </ul>	
2	Fall Army Worm	<ul style="list-style-type: none"> <li>The hatchlings feeds delicate parts of leaves</li> <li>Damage becomes obvious at about 3-4 days</li> </ul>	<ul style="list-style-type: none"> <li>Use of lambda-cyhalothrin 2.5% EC @ 500ml/Ha (25ml 15L knapsack sprayer)</li> </ul>	
3	Common Cutworm	<ul style="list-style-type: none"> <li>Affects Upland rice</li> <li>Attack seedlings at the base.</li> <li>Young caterpillars feed on the soft leaves.</li> </ul>	<ul style="list-style-type: none"> <li>Use resistant varieties</li> <li>Use of lambda-cyhalothrin 2.5% EC @ 500ml/Ha (25ml 15L knapsack sprayer)</li> </ul>	
4	Birds	<ul style="list-style-type: none"> <li>The damage caused by birds usually occur at sowing or at reproductive stage (milking stage)</li> </ul>	<ul style="list-style-type: none"> <li>Use of scare crows</li> <li>Tying of light reflecting tape</li> <li>Use of fish net to cover the rice crop at maturity period</li> </ul>	

S. No	Nutrient	Deficiency Symptoms	Reference	Healthy Rice	Reference
1	Nitrogen	<ul style="list-style-type: none"> <li>Yellowing of older leaves &amp; Stunted growth</li> <li>Poor crop stand</li> <li>Reduced Yield</li> </ul>		<ul style="list-style-type: none"> <li>Green Foliage</li> <li>Vegetative Growth</li> <li>Bumper harvest</li> </ul>	
2	Phosphorous	<ul style="list-style-type: none"> <li>Purple coloration of older leaves</li> <li>Low tillering</li> <li>Poor crop stand</li> </ul>		<ul style="list-style-type: none"> <li>Good rooting system</li> <li>High tillering</li> <li>Well-developed panicles</li> </ul>	
3	Potassium	<ul style="list-style-type: none"> <li>Yellowing of tips or margin of the leaves extending to the center of leaf base which becomes necrotic (dead spots)</li> <li>Weak stems and reduced disease resistance and drought tolerance</li> <li>Crop lodging at maturity</li> </ul>		<ul style="list-style-type: none"> <li>Disease resistance</li> <li>Drought tolerance</li> <li>Bumper harvest</li> </ul>	
4	Sulphur	<ul style="list-style-type: none"> <li>Yellowing of Leaves</li> <li>Reduced growth</li> <li>Delayed Maturity</li> </ul>		<ul style="list-style-type: none"> <li>Green leaves</li> <li>Good tillering and even growth</li> <li>Early maturing</li> </ul>	

#### INDORAMA GRANULAR UREA



- Uniform granule size.
- Low moisture, anticaking properties, low biuret content & Free flowing.
- Higher crushing strength, which prevents caking.
- Standards Organization of Nigeria (SON) Certified.

#### INDORAMA NEEM COATED UREA



- Enhances the nitrogen use efficiency and crop remain green for longer time.
- It increases crop productivity
- Protect crop from pest and diseases.
- Prevent Urea application losses by Volatilization and Leaching.

#### INDORAMA NPK



- Indorama NPK maintains quality and have a perfect balance of nitrogen, phosphorus, and potassium.
- Nitrogen is needed for vegetative growth.
- Phosphorus is needed to produce strong roots and shoots.
- Potassium is needed to produce quality fruit and flowers, also increases resistance to diseases.
- Calcium from limestone granules helps in decreasing soil acidity.

**INDORAMA**  
Essential materials. Better lives.

## Rice



## Sow, Nurture, Reap Paddy Rice Journey to Sustain Nigeria's Hunger Needs

Nigeria is the largest paddy rice producer in sub-Saharan Africa with approximately 8.3 million tons of rice produced from 4.3 million hectare cultivated in 2021. Average yield of rice in Nigeria is 1.9 tons per ha. Rice is an important and strategic staple food crop. It has become a food security crop employing over 15 million people in its value chain in Nigeria. Nigeria's rice consumption was projected to rise to 35 million metric tons by 2050, increasing at the rate of 7% per annum due to estimated population growth.



GET IT ON  
Google Play

Download on the  
App Store



**FMAFS**  
FEDERAL MINISTRY OF AGRICULTURE  
AND FOOD SECURITY, FEDERAL REPUBLIC  
OF NIGERIA





## Land Preparation and Soil Requirement

- The land selected should be void of debris or stubbles from previous crops.
- Tillage involves ploughing and harrowing to a fine tilth for both upland and lowland rice.
- For lowland cultivation, soil puddling is done to improve water retention capacity.
- Pre-planting herbicide (Glyphosate) at the rate of 3 l a.i./ha should be sprayed two weeks prior to harrowing.
- Make sunken beds to impound and retain more water in lowland cultivation.
- As much as possible avoid a slopy land to prevent erosion and nutrient leaching.
- Clay loam soil which becomes soft on wetting but develops cracks on drying is suitable for rice production.
- For good mineralization of organic manure, it should be incorporated into the soil 3-4 weeks before sowing/ transplanting at the rate of 5 to 10 tons/ha depending on the quality.

## Seed Rate and Time of Sowing

- Obtain seed from reputable licensed seed companies or research institutes.
- Seed should be treated using a dressing chemical (such as 20 % Metalaxyl + 20 % Imidacloprid at the rate of 10 g per 4 kg of the seeds).
- Sowing is done once rain get established (early or mid-June depending on location).

S No.	Sowing Methods	Seed rate (kg/ha)	Spacing
1	Broadcasting	80-100	Spread uniformly or evenly
2	Dibbling	40-60	20 cm x 20 cm
3	Drilling	60-80	20 cm inter-row
4	Transplanting	25-40	20 cm x 20 cm

## For transplanting

- For nursery, Indorama NPK should be applied at the rate of 10g/m<sup>2</sup>.
- The nursery should be established and maintained by watering at 2 to 4 days interval depending on soil type.
- Healthy seedlings are transplanted 14-21 days after sowing, preferably early in the morning or late evening.
- Two seedlings per stand or hill at 3 cm depth is recommended.
- The recommended spacing is 20 x 20 cm

## For direct sowing

- It is advisable for seeds to be soaked in clean water 12-18 hours before sowing.
- When dibbling, it should be at a spacing of 20 x 20 cm.

## Fertilizer Management with 4R Nutrient Stewardship

- Before fertilizer application, it is important to ensure that the soil is moist and weed free.
- Apply nitrogen, phosphorus, and potassium fertilizer at the rate of 100-120 kg N: 50-60 kg P<sub>2</sub>O<sub>5</sub>: 50-60 kg K<sub>2</sub>O/ha.
- Apply 8 bags (400kg) of Indorama NPK per hectare during land preparation.
- Top dress with 1.5 bags (75kg) of Indorama Neem Coated Urea at 3 weeks (tillering stage) and 1 bag (50kg) at 6 weeks (panicle initiation stage) after transplanting.



## How to Reduce Fertilizer Loss

- Apply fertilizer early in the morning or in the evening time.
- Avoid fertilizer application when it is about to rain or when the weather is cloudy.
- Always apply Indorama Neem Coated Urea fertilizer in split doses for better efficacy.
- Apply nitrogen fertilizer after weeding to prevent weed invasion.
- Apply only the recommended dose of fertilizer.

## Pest and Diseases Management

- Insect pests include: stem borers, termite or army worm, weevils (*Sitophilus oryzae*), rodents or birds.
- The most common diseases of rice on farmer's field are rice blast and bacterial leaf blast

## Weed Control

- Timely weed control is important in the early stages of growth.
- Two weeding may be required before the crop reaches maturity.
  - 1st weeding 2-3 weeks after sowing/transplanting
  - 2nd weeding 5-6 weeks after sowing/transplanting
- For chemical weed control; apply pre-emergence herbicide (Pendimethalin at 2.5 L/ha) two days after sowing.
- Apply post-emergence herbicide (Propanil + 2,4-D amine (360+ 200g/L EC at 1.25-2.5 L/ha) 2-3 weeks after transplanting.

## Harvesting and Crop Storage

- Harvesting should be done when the leaves turn yellow and the panicles turn brown.
- Moisture content should be 12-14%.
- To evaluate moisture level:
  - Put one teaspoon of dry salt in a dry transparent bottle;
  - Add grains in the bottle and cover with top for few minutes;
  - Shake the contents and empty bottle;
  - If salt sticks to inside of bottle, the moisture is greater than 14%;
  - If bottle remains empty and transparent, then grain is dried enough and suitable for packaging and/or storage.
- Harvesting can be done manually with sickle or mechanically using combine harvester.
- The plants will then be sundried, threshed and winnowed to obtain clean rice.
- Rice can be put inside an airtight container like sack or plastic drum, after proper drying.
- One tablet of phostoxin is enclosed in a perforated envelope or wrapped in a piece of cloth and put inside a 100 kg sack of rice grain.
- To protect the paddy against insect pests, apply 1½ matchbox full of permethrin (250g/ kg) to about 25 kg of rice.
- store in cool, dry, well-ventilated and rodent-proof conditions.

**BEST FARMING PRACTICES**