
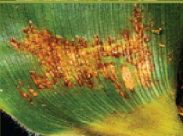





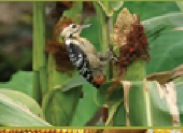











S. No	Diseases	Damage	Control	Reference
1	Leaf blight	<ul style="list-style-type: none"> <li>Affects the direction of veins</li> <li>Causes premature drying of leaves and spreading to upper leaves</li> <li>Loss of leaf area for photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>Apply broad spectrum fungicide e.g mancozeb 2.5g/l at 8-10days interval</li> </ul>	
2	Rust	<ul style="list-style-type: none"> <li>Damage caused is chlorosis and death of leaf occurs in severe infection</li> </ul>	<ul style="list-style-type: none"> <li>Apply Chlorothalonil at 1-2.5 kg/ha and Mancozeb at Mancozeb 2.5g/l</li> <li>Commence spray when there are on average of six postules per leaf</li> <li>Resistance varieties can be sourced as means of prevention</li> </ul>	
3	Downy mildew	<ul style="list-style-type: none"> <li>Stunted growth</li> <li>Bushy appearance</li> <li>Shortening of internodes</li> </ul>	<ul style="list-style-type: none"> <li>Deep ploughing</li> <li>Treat the seeds with metalaxyl at 6g/kg</li> <li>Crop rotation with pulses</li> <li>Rogue out infected plants</li> <li>Spray the crop with Metalaxyl + Mancozeb at 1kg/ha on 20th day after sowing</li> <li>Plant variety that has resistance to downy mildew</li> </ul>	
4	Maize smut	<ul style="list-style-type: none"> <li>Damages plants</li> <li>Reduces yields</li> <li>Forming galls on the ears, stalks and leaves</li> </ul>	<ul style="list-style-type: none"> <li>No chemical control for corn smut</li> <li>Spread can be controlled by removing galls before they</li> <li>Mature and clearing corn litter each fall</li> </ul>	

S. No	Pest	Damage	Control	Reference
1	Fall Armyworm	<ul style="list-style-type: none"> <li>Severe crop defoliation</li> <li>Attack maize ear, silks and kernels</li> <li>Detrimental effect on cob development and reduce crop yield</li> </ul>	<ul style="list-style-type: none"> <li>Emamectin benzoate 5%WDG</li> <li>Sprayed at 10 to 15grams per 16litres knapsack sprayer</li> <li>Apply very early in the morning</li> <li>The spray should be targeted into the funnel hole of the maize and entire foliage</li> </ul>	
2	Stem borers	<ul style="list-style-type: none"> <li>They feed on young leaves</li> <li>Enter into the stems and cobs</li> <li>Caterpillars kills the growing points of the plant</li> <li>Causing what is known as dead-heart</li> </ul>	<ul style="list-style-type: none"> <li>Apply Furadan, 3g to 10g carbofuran</li> <li>At the rate of 0.75 kg ai/ha as side dressing</li> <li>Should be 10 cm away from maize stands</li> <li>Dimethoate 30% EC 660 ml/ha</li> <li>Maintaining adequate soil fertility</li> <li>Practices that increase nitrogen use efficiency</li> </ul>	
3	Weevils	<ul style="list-style-type: none"> <li>Emergence failure</li> <li>Wilting and collapse of maize stand</li> </ul>	<ul style="list-style-type: none"> <li>Imidacloprid 200 g/l at 150ml/ha</li> <li>Thiacloprid 150g/l + Deltamethrin 20 g/l at</li> </ul>	
4	Birds	<ul style="list-style-type: none"> <li>Birds remove maize seed at germination</li> <li>Maize seedling fall off</li> <li>At maturity birds tends to peck on grains at the cob</li> </ul>	<ul style="list-style-type: none"> <li>Make scarecrow</li> <li>Tie CDs to stick at different places on the farm</li> <li>The CDs reflect and causes flashes</li> <li>The sudden flashes then scare the birds</li> </ul>	
5	Rodents	<ul style="list-style-type: none"> <li>Removal and eating seeds at planting</li> <li>Damaging the cobs of the stand that falls down in the field</li> <li>The eating grain at store rooms</li> </ul>	<ul style="list-style-type: none"> <li>Use of zinc phosphide rodenticide with food baits</li> <li>Traps and other poisonous baits can be used on the field</li> </ul>	

S. No	Nutrient	Deficiency Symptoms	Reference	Healthy Maize	Reference
1	Nitrogen	<ul style="list-style-type: none"> <li>Stunted growth</li> <li>Yellowing of older leaves</li> <li>Reduced yield</li> </ul>		<ul style="list-style-type: none"> <li>Vibrant growth</li> <li>Green and lush leaves</li> <li>Bumper harvest</li> </ul>	
2	Phosphorous	<ul style="list-style-type: none"> <li>Purple or reddish leaves</li> <li>Delayed maturity</li> <li>Poor kernel formation</li> </ul>		<ul style="list-style-type: none"> <li>Green and lush leaves</li> <li>Early maturity</li> <li>Big and heavy cobs</li> </ul>	
3	Potassium	<ul style="list-style-type: none"> <li>Leaf margins scorching or browning</li> <li>Weak stalks and lodging</li> <li>Reduced disease resistance</li> </ul>		<ul style="list-style-type: none"> <li>Proper grain filling and high quality cobs</li> <li>Good stem and tissue formation</li> <li>High disease resistance</li> </ul>	
4	Zinc	<ul style="list-style-type: none"> <li>Poor root formation</li> <li>Yellowing of leave veins</li> <li>Reduced tasseling</li> <li>Reduced grain filling</li> </ul>		<ul style="list-style-type: none"> <li>Excellent root formation</li> <li>Green leaves</li> <li>Good tassel formation</li> <li>Improved grain filling</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.

## Maize

## Nourishing Nigeria with the "Queen of Cereals"

Maize has gradually become an important crop in Nigeria over the past few decades, suppressing the cultivation of traditional crops such as sorghum and millet. It is the most widely cultivated crop in the country from the wet evergreen climate of the forest zone to the dry ecology of the Sudan savanna. The crop is known as the “Queen of cereals” due to its genetic potential and acceptability compared to other cereals. Nigeria produces an average of 12.7 million tons of maize from 6.2 million hectares of land, making it Africa's largest producer of maize with an average yield of 2 ton/ha



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





# MAIZE CROP

## Land Preparation and Soil Requirement

- The land selected should be void of debris or stubbles from previous crops.
- The land should be ploughed, harrowed, and ridged.
- The field should be harrowed twice before ridging to ensure adequate tillage.
- Ridging is done at the spacing of 75 cm.
- Where the land is slopy, ridge across the slope to prevent erosion.
- Pre-planting herbicide (Glyphosate) at the rate of 3 L /ha should be sprayed two weeks to planting.
- Pre-emergence herbicide Prometryn 15% + Acetochlor 25% E. C, 2-3 L/Ha at the rate of 2 .00 kg a.i /ha can be applied.
- Organic manure should be incorporated into the soil two weeks before sowing at the rate of 8-10 tons/ha. This will improve the soil physical structure and maintain soil health.



## Seed Rate and Time of Sowing

- Obtain seed from reputable licensed seed companies or research institutes.
- The seed rate of 25 kg /ha is recommended for open pollinated varieties while 15kg/ha is for hybrids.
- Seed should be treated using a seed dressing chemical (such as Imidacloprid 20 % + Metalaxyl – M 20 % + Tebuconazole 2 % WS at the rate of 10 g per 4 kg of the seeds).
- Sowing is done once the rain is fully established.
- Timely sowing reduces the incidence of insects and diseases.
- Seeds are sown at the rate of one seed per hole for hybrids and 2 seeds per hole for open pollinated varieties at a depth of about 3-5cm.
- Spacing between plants should be 25 cm X 75 cm intra and inter row spacing.
- All missing stands should be reseeded 7 days after sowing



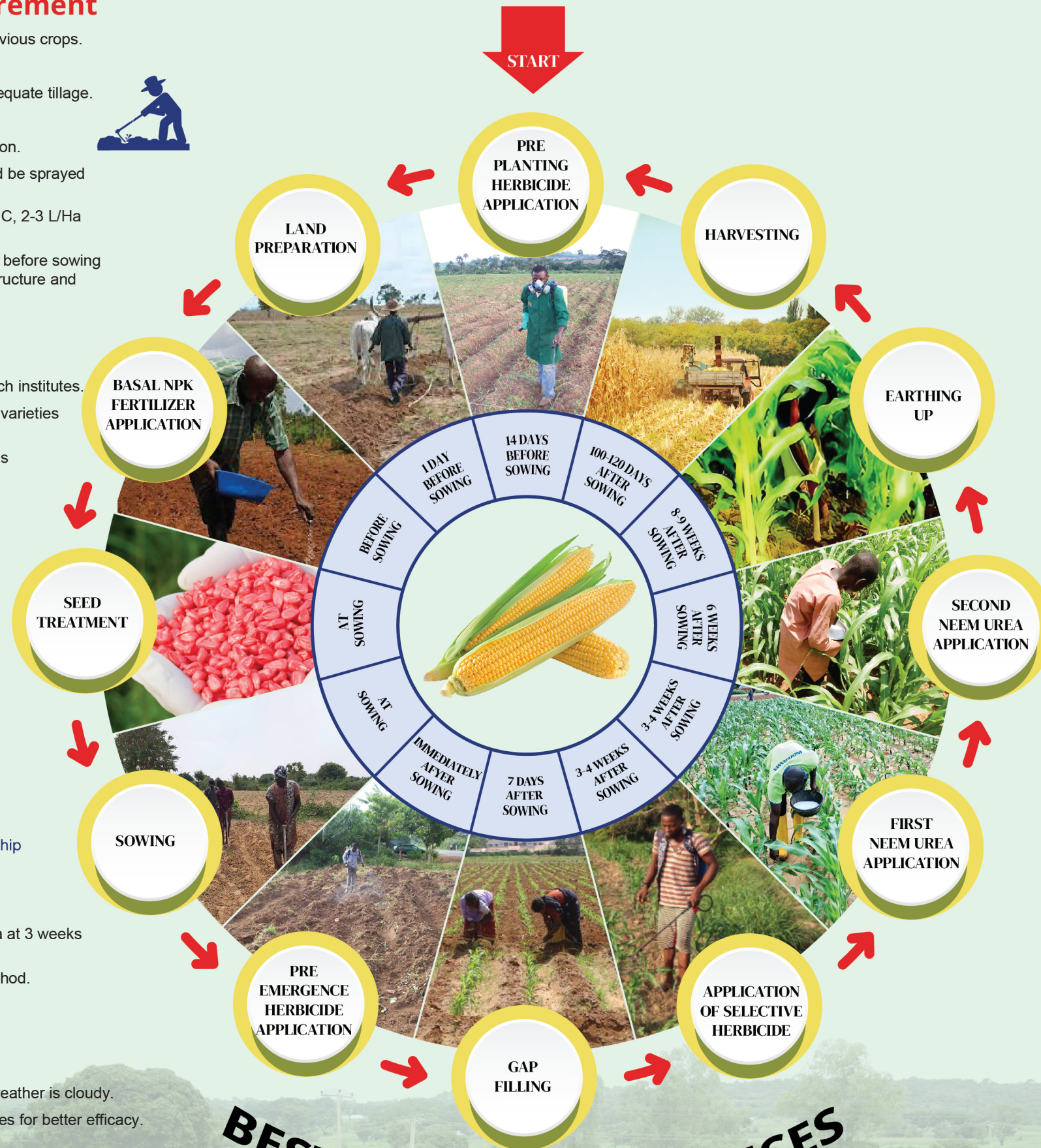
## Fertilizer Management with 4R Nutrient Stewardship

- Before fertilizer application, it is important to ensure that the soil is moist and weed free.
- Apply fertilizer at the rate of 120-150 kg N: 60-75kg P2O5: 60-75 kg K2O/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 and 1 bag (50kg) at 6 weeks after sowing.
- Apply the fertilizer 10 cm away from the crop using dibbling method.



## 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.
- Side placement of fertilizer is recommended for maize.
- Always cover applied fertilizer with soil to prevent volatilization losses.
- Apply nitrogen fertilizer after weeding to prevent weed invasion.
- Apply only the recommended dose of fertilizer.



## Weed Control

- For pre-emergence herbicide, Apply Prometryn 15% + Acetochlor 25% E. C, 2-3 L/Ha or 500 ml of isoxaflutole + aclonifene (50 + 330 g/L) immediately after sowing.
- Post-emergence herbicide (Nicosulfuron) can be applied at the rate of 8.5g a.i/ha at 4 weeks after sowing.
- Alternatively, hoe weeding should be carried out at 3 and 6 weeks after sowing.
- Earthing up should be done at 8-9 weeks after sowing.
- Use striga weed tolerant/resistant varieties of maize.



## Pest and Diseases Management

- Pests include fall armyworm, stem borers, weevils, birds and rodents.
- The major diseases of maize are: leaf blight, rust, downy mildew, maize smut

## Pest Control

- Plough the soil to expose over-seasoned soil pests and prevent damage on maize crop.
- Apply Furadan at 0.75kg a.i/ha; or Emamectin benzoate 5% WDG at 100g/ha or 10g per
- 15 litre sprayer to control stemborers such as fall armyworm.
- Scare crows and traps can be used against birds and rodents respectively.
- Use bio-pesticides such as neem-extracts to control insect pests

## Disease Control

- Employ seed treatment to control seed-borne diseases.
- Ensure field sanitation by removing weeds that could serve as alternate hosts to diseases.
- Use improved varieties that are resistant/tolerant to diseases.
- Practice crop rotation with non-host crops.



## Harvesting and Crop Storage

- Harvesting is done when the cob (husk) completely turns brown and a black layer is formed at the tip of the kernel.
- Harvesting can be done manually or mechanically using combine harvester.
- Cobs should be properly dried to attain 10-12% moisture content.
- 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.
- 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 maize grain.
- Store in cool, dry, well-ventilated and rodent-proof conditions.



**BEST FARMING PRACTICES**

INDORAMA

Indorama Fertilizer: Improving Agriculture, Improving Lives