














S. No	Diseases	Damage	Control	Reference
1	Potato Leafroll virus (Aphids spp.)	<ul style="list-style-type: none"> Spreads by infected seed tubers or by aphids (insect) that brings the disease from one field to another Symptom: Young leaves to roll and turn yellow or pink Over time the viral disease causes the plants to have stunted growth 	<ul style="list-style-type: none"> Since is a viral disease, there is no treatment, but using insecticides to stop an aphid infestation is a smart idea Always remove and destroy infected plants and tubers to stop the spread of this virus Use resistant potato varieties 	
2	Late Blight (Is a fungal disease caused by Phytophthora infestans)	<ul style="list-style-type: none"> Severe infections at time of high rainfall, high humidity, and low temperature Other causes are infested seed and remnants of infected plants The white powder on affected leaves can be carried by the wind and spread the disease to other plants 	<ul style="list-style-type: none"> Rotate potato with other crops such as maize, soybean Use resistant varieties (if available) Use of chemicals (mancozeb) @ 2L/Ha Regular field observation once every two mornings, beginning when plants emerge from the ground 	
3	Common scab (Is a fungal caused by Streptomyces scabies.)	<ul style="list-style-type: none"> Symptoms is raised brown lesions with a strange, corky texture on the tubers Eventually, the lesions turn brown or black with a straw-coloured tissue underneath on the potato Can come from soil, uncomposed manure, seed, through contaminated water and common in field with low soil pH 	<ul style="list-style-type: none"> Rotate potato with other crops such as maize, soybean Use healthy, disease free seed Avoid planting in fields with low soil pH Avoid damage to tubers when weeding, eaten up, harvesting Remove infected tubers and destroy them 	

S. No	Pest	Damage	Control	Reference
1	Aphid	<ul style="list-style-type: none"> Distort leaves and stems Stunt plants Cause necrotic spots on leaves 	<ul style="list-style-type: none"> Use of imidacloprid, thiamethoxam, dinotefuran, and thiacloprid 	
2	White fly	<ul style="list-style-type: none"> Sucking of plant sap Weakened and poor growth Leaves often turn yellow 	<ul style="list-style-type: none"> Imidacloprid 2F at the rate of 175 mls/ha at 5 -10 days interval 	
3	Root Knot nematode (meloidogyne spp)	<ul style="list-style-type: none"> They are small worms that you cannot see with the eye Sources of these diseases are nematodes in the soil and seed contaminated with nematodes 	<ul style="list-style-type: none"> Do not store infected tubers nor use them for seed. Use healthy, nematode-free seed. Pull up wilting plants and observe their roots for sign of nematodes infections Bio fumigation in case of severely infested soils 	
4	Golden cyst nematode (Globodera spp)	<ul style="list-style-type: none"> Nematodes are small worms that you can't see with necked eye.Can spread to other fields through soil on tools, boots and seed tubers First symptom is poor growth of plants in one or more spots in the field 	<ul style="list-style-type: none"> Biofumigation in case of severely infested soils Do not store infected tubers nor use them for seed. Use healthy, nematode-free seed. Use clean tools and boots 	

S. No	Nutrient	Deficiency Symptoms	Reference	Healthy Potato	Reference
1	Nitrogen	<ul style="list-style-type: none"> Pale yellow green colour of leaves Old leaves remain yellow while younger one turn dark Reduced number of stems and tubers Increased prevalent of small brown spot and hollow heart 		<ul style="list-style-type: none"> Green Foliage Helps in photosynthesis Stimulates vegetative growth 	
2	Phosphorus	<ul style="list-style-type: none"> Distinct purple colouration of older leaves and stem Small dark green leaves Stunted growth Upward cupping of the leaf blades Tubers have rusty brown isolated flecks 		<ul style="list-style-type: none"> Encourage healthy root development Provide strong stems and leaves Promote tuber development Improve quality of potato 	
3	Potassium	<ul style="list-style-type: none"> Poor root and leaf growth Yellowing of tips or margin of the leaves extending to the centre of leaf base which becomes necrotic (dead spots) Stunted growth Reduced disease resistance 		<ul style="list-style-type: none"> Improves the quality of the potato Improves disease resistance Enhance the shelf life of the potato 	

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.

Potato

Nigeria's Pride in Every Bite, Grown with Farmer's Love

Potato is the most cultivated, researched and most efficient tuber crop. It requires a cool weather for tuber initiation and development, thus, the reason why 70% of world produced potato comes from the temperate climate particularly Europe. In the tropics, production is limited to higher altitudes. The world production of potatoes is about 376 million tonnes while Nigeria produced about 1.3 million tonnes. The average yield in Nigeria 3.7 ton/ha. About 80% of the crop produced in Nigeria comes from Plateau State. Other producing States in the country include Kaduna, Kano, Bauchi, Borno, Zamfara, Kebbi, Sokoto, Katsina, Yobe and Taraba where the production is mostly during the cold harmattan period.



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



POTATO CROP

Land Preparation and Soil Requirement

- The crop is cool weather loving and does well with temperature between 15-29 degree celcius.
- Rainy season production of potato depends on the onset of rain (May/June)
- Dry season production should coincide with the coolest months (November/January).
- Potato requires fertile soil with good moisture retention and adequate organic matter.
- The soil pH of 5.2 – 6.4 is optimum for cultivation of potato.
- It also requires warm or sunny weather during tuberization.
- Well distributed rainfall of about 1,000 – 1,500 mm is adequate for the crop.
- Pre-planting herbicide (Glyphosate at the rate of 2 L/ha) should be sprayed 2 weeks to land preparation.
- The land should be cleared and harrowed to a fine tilth.
- Ridges should be made 75 or 90cm apart.



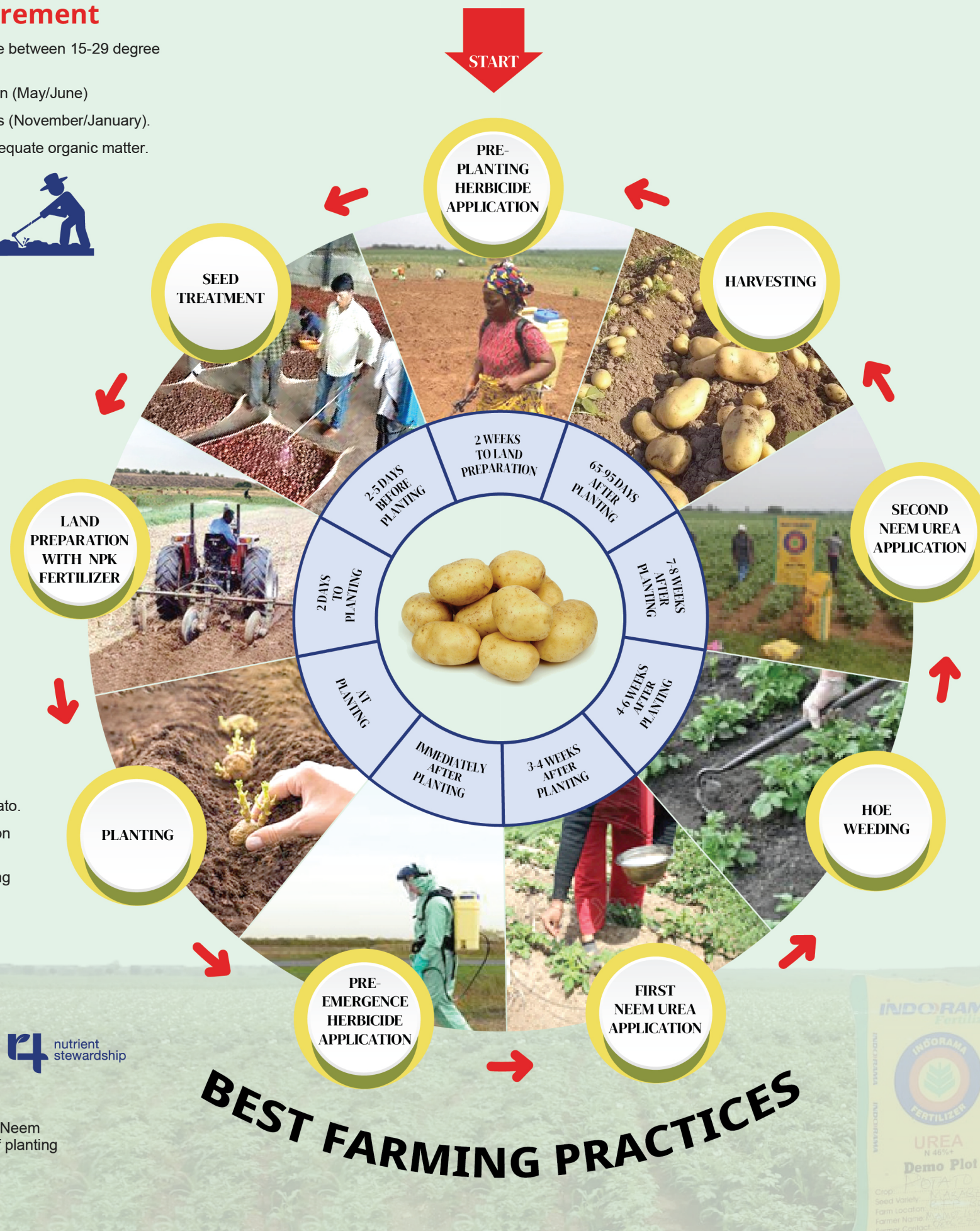
Pre-planting Seed Treatment and Sowing

- Potato tubers should be spread in a well-ventilated room with diffused light to enhance sprouting.
- The tubers are sometimes covered with jute bags and occasionally sprinkled with water.
- The tubers are then dressed with Dithane M-45 a day to planting.
- The treated cut setts should be spread in a room for 3-4 days to allow for wound healing.
- Tubers around 35 grams should be considered for planting.
- For cut setts, larger tubers are cut into 2 or more pieces of equivalent weight (35 -50g).
- A sharp knife should be sterilized by dipping in a 95% alcohol and used for cutting the tubers.
- Each cut piece should contain 1 or more eyes (sprouts).
- Tubers should be cut at right angle to avoid apical dominance.
- Plant spacing is 30 cm for ware potato and 25 cm for seed potato.
- Tubers are planted at a depth of 8-10cm to facilitate germination and ensure that the sprouts are turned upwards.
- Shallow planting expose tubers to sunlight while deeper planting delays germination.



Fertilizer Management with 4R Nutrient Stewardship

- The crop requires 150 kg Nitrogen, 100 kg Phosphorus and 100 kg Potassium per hectare.
- About 20 numbers of 50 kg bags (1000 kg) of Indorama NPK is required for 1 hectare of land.
- The Indorama NPK should be applied during land preparation.
- Top dress with 3 numbers of 50 kg bags (150 Kg) of Indorama Neem coated urea at 3-4 weeks of planting and again at 7-8 weeks of planting
- Apply the fertilizer 10 cm away from the stand and 5cm deep.
- Avoid contact of fertilizer with the seeds.



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 Urea fertilizer in split doses for better efficacy.
- Side placement of fertilizer is recommended.
- Always cover applied fertilizer with soil to prevent volatilization losses.
- Apply urea fertilizer after weeding to prevent weed invasion.
- Apply only the recommended dose of fertilizer.



Weed Control

- Potato is sensitive to weed infestation which may cause yield loss of 50% or more.
- Weeds can be controlled by hand hoe weeding up to the stage when the canopy covers the space between plant stands (4 – 6 week's after planting).
- Herbicides like Metolachlor (0.7 kg a.i/ha), Metribuzin (0.8kg a.i/ha), can be used for weed control in potato fields.



Pest and Disease Management

- Prevalent pests and diseases of potato include potato bugs which can be controlled using insecticides such as cyhalothrin and Imidacloprid.
- Common diseases of potato include Early blight, Fusarium dry rot, pink rot and late blight.
- Diseases can be controlled by Seed treatment, field sanitation, removing weak, dead and disease plants, use of improved varieties that are resistant/tolerant to pests and diseases, and the practice of crop rotation with non-host crops.
- Chemical control for Blight disease is achieved using fungicide.



Harvesting

- Potato is ready for harvest in 65 – 95 days depending on the variety, physiological stage of the seed tuber, day length and temperature.
- Leaves of mature crop turns yellow or dry while the stem prostrate.
- In the latter case, the haulm is killed, and the tuber remains in the soil for at least 2 weeks to allow the skin to set before harvesting.
- Tubers are harvested with the aid of hoe or hand fork with care taken not to injure the tubers and provide entry point for diseases.
- To prevent tuber rot and black heart, potatoes are best harvested early morning or late afternoons when the temperatures are low.



BEST FARMING PRACTICES

Indorama Fertilizer: Improving Agriculture, Improving Lives

