

# Fertilizer Bulk Blending

Harmonized Guidelines of Good Practices for Quality Control Across West Africa



# Objectives and benefits for blenders

To produce **quality fertilizer blends** through the use of guidelines for fertilizer blending

Quality fertilizer blends will lead to

- Happy customers >> more business >> higher profit
- Increase in agriculture productivity >> prosperity for the whole country

# Objectives and benefits for regulators

To facilitate monitoring of fertilizer blending operations in the production of quality fertilizer blends through the use of guidelines for fertilizer blending

Quality fertilizer blends will lead to

- Increase in agriculture productivity >> prosperity for the whole country



# This training program

- Part 1: Introduction
- Part 2: Setting up a blending operation
- Part 3: Operating a blending facility
- Part 4: Record keeping



# Sources



Guidelines are in line with

- ECOWAS regulatory framework and standards (regulation C/REG. 13/12/12 on fertilizer quality control)
- International standards for fertilizer blending set by
  - European Committee for Standardization (CEN)
  - International Organization for Standardization (ISO)

# Part 1: Setting the scene





# What is a ....

## Compound fertilizer

A **fertilizer** that has a declarable content of at least two of the plant nutrients, nitrogen (N), phosphorus (P), and potassium (K) obtained chemically, by blending, or both.

## Straight fertilizer

A fertilizer that **contains only** one macronutrient, e.g., urea (46% N), single superphosphate (16%  $P_2O_5$ ), muriate of potash (60%  $K_2O$ ), or sulfate of potash (50%  $K_2O$ ), and may contain some micronutrients. Also called a single-element fertilizer in West Africa.



# What is a ....



## Binder

Material sometimes added to a blend to aid in **preventing segregation**.

## Filler

Materials added to fertilizers to help in the **uniform distribution** of nutrients within a given volume of the fertilizer product.

## Neutralizers

Substances added **to counteract the acidity** or basicity of soils or fertilizers, e.g., dolomitic limestone (basic) are added to ammonium sulfate (acidic) mixed fertilizers.

# What is a ....



## Fertilizer grade

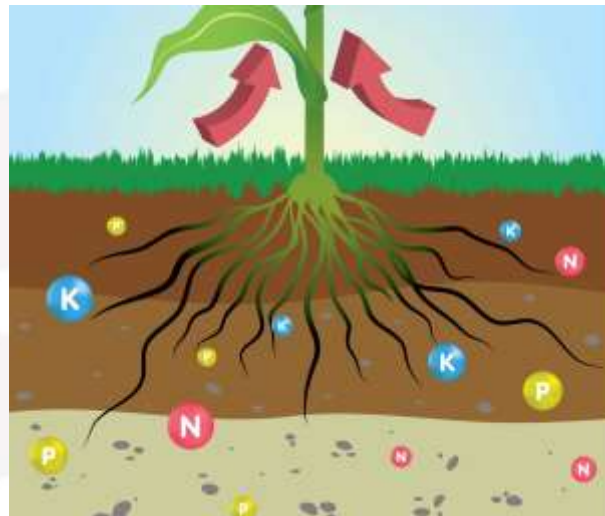
Percentage content of total N, available P<sub>2</sub>O<sub>5</sub> (phosphoric acid), and soluble K<sub>2</sub>O (potash), e.g., 20-10-10, 15-15-15, and 27-13-13.

## Throughput

The quantity of raw materials passing through the production facility i.e., an aggregation of raw materials received and produced blends dispatched.

# Do you still know some plant nutrients??

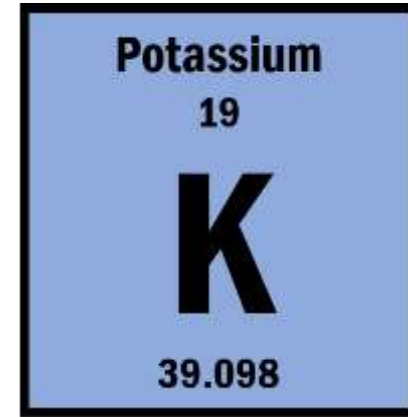
Boron (Bo)  
Calcium (Ca)  
Chlorine (Cl)  
Cobalt (Co)  
Copper (Cu)  
Iodine (I)  
Iron (Fe)  
Magnesium (Mg)  
Manganese (Mn)  
Molybdenum (Mo)



Nickel (Ni)  
Nitrogen (N)  
Phosphorus (P)  
Potassium (K)  
Selenium (Se)  
Silicon (Si)  
Sodium (Na)  
Sulfur (S)  
Zinc (Zn)

# Potash or Potassium?

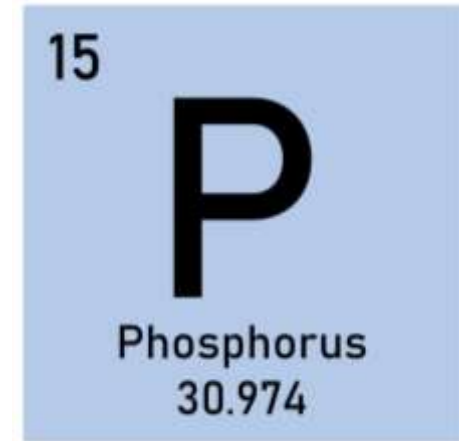
- The elemental form is **Potassium (K)**
- Potash is the common name given to a group of minerals and chemicals that contain potassium and is depicted as  $K_2O$



We will use **Potash** as reference for K



# Phosphate or Phosphorus?



- The elemental form is **Phosphorus (P)**
- Phosphate is an electrically charged particle that contains the mineral phosphorus and is depicted as  $P_2O_5$

We will use **Phosphate** as reference to P



# Producing Quality Blend



On which 3 factors depends the **quality of fertilizer blend**?

- The quality of the raw materials: the **concentration of nutrients** must be known
- The quality of the blending **process**
- The **environmental factors** around the blending side such as critical relative humidity, temperature, moisture content, weather, and climatic conditions, of the site where the blending operations will take place.

# Common challenges with fertilizer blends

1. Underweight bags are common.
2. The quality of the same bulk blend formula varies from country to country.
3. Insufficient nutrient addition during blending operations is the major cause of nutrient shortfalls in blended products.
4. The physical characteristics of fertilizer raw materials directly impact the quality of blended products.
5. NPK blends present more cases of poor product quality than NPK compounds.
6. Segregation is a major issue for blend quality but has minimal effect on the shortfalls of nutrients in blended products.
7. Adulterated blended products are minimal.

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