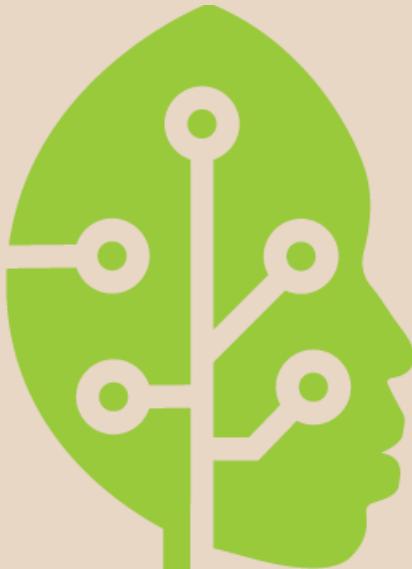


Hi there!



AKILIMO

we know cassava



You will learn all about

Acre
version

Tailored fertilizer recommendations

and how to use our printable guides

in **6** easy steps



You will learn

You will learn

1 The importance of good agronomic practices

You will learn

- 
- 1** The importance of good agronomic practices
 - 2** How to choose the right fertilizer types

You will learn

1 The importance of good agronomic practices

2 How to choose the right fertilizer types

3 How to obtain the recommended fertilizer rate

You will learn

1 The importance of good agronomic practices

2 How to choose the right fertilizer types

3 How to obtain the recommended fertilizer rate

4 How to evaluate if fertilizer use is profitable

You will learn

1 The importance of good agronomic practices

2 How to choose the right fertilizer types

3 How to obtain the recommended fertilizer rate

4 How to evaluate if fertilizer use is profitable

5 When to apply the fertilizer

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3 How to obtain the recommended fertilizer rate

4 How to evaluate if fertilizer use is profitable

5 When to apply the fertilizer

6 How to apply fertilizer correctly

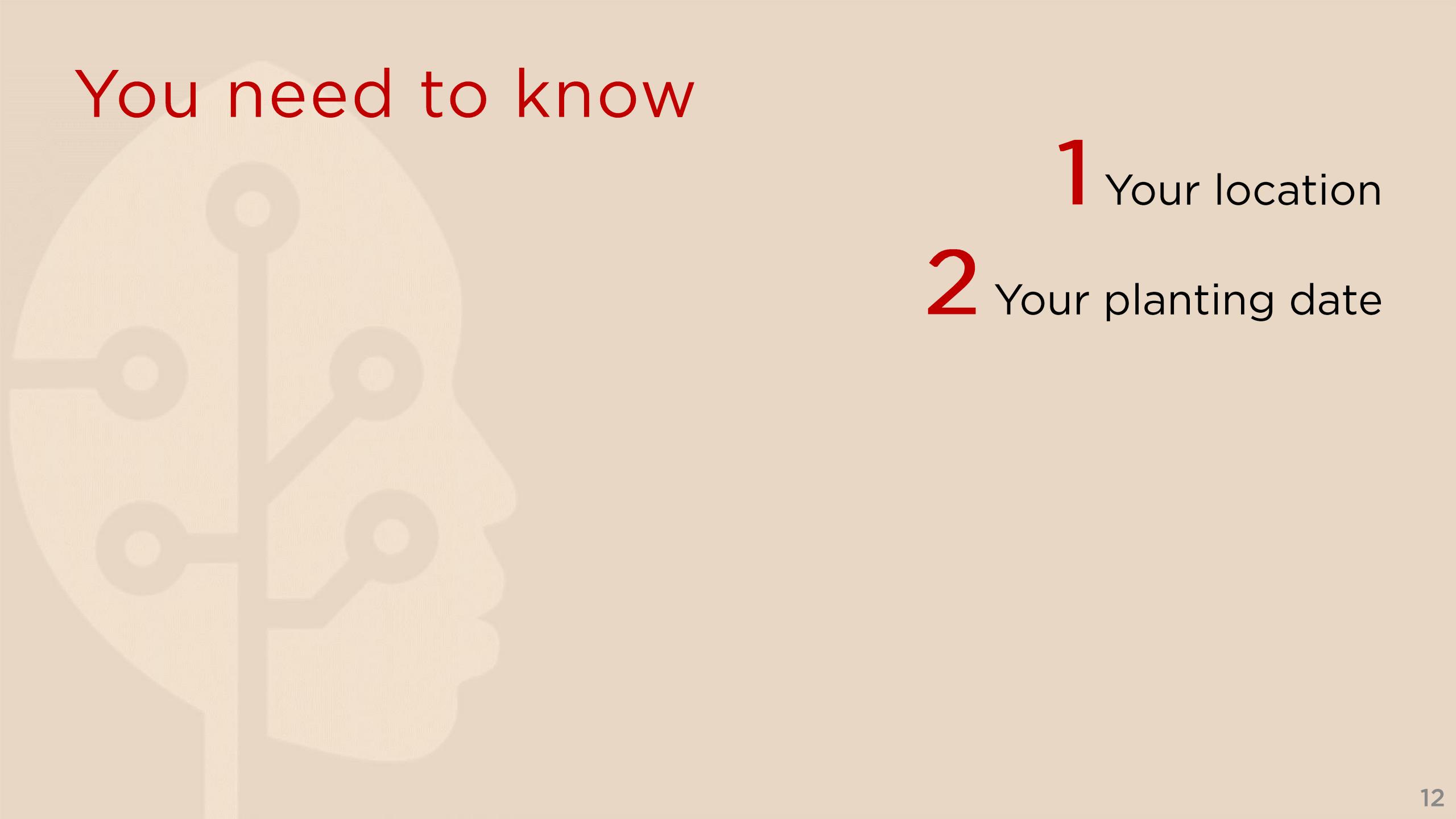
You need to know

You need to know

1 Your location



You need to know



1 Your location

2 Your planting date

You need to know

1 Your location

2 Your planting date

3 Your current cassava yield (without fertilizer)

You need to know

1 Your location

2 Your planting date

3 Your current cassava yield (without fertilizer)

4 The price of fertilizer

You need to know

1 Your location

2 Your planting date

3 Your current cassava yield (without fertilizer)

4 The price of fertilizer

5 The expected price for your cassava roots

You need to know

1 Your location

2 Your planting date

3 Your current cassava yield (without fertilizer)

4 The price of fertilizer

5 The expected price for your cassava roots

6 Your land area

You will use AKILIMO guide

The screenshot shows a mobile application interface titled "Tailored Fertilizer Application Recommendations for Cassava". At the top, there is a cassava leaf icon, the ACAI logo, and the AKILIMO logo with the tagline "we know cassava". To the right, a vertical menu lists six steps: STEP 1: Good Agro-Practices, STEP 2: Choose the Best Fertilizer, STEP 3: Fertilizer Application Rate, STEP 4: Calculate Cost and Benefits, STEP 5: Fertilizer Application Time, and STEP 6: Fertilizer Application Method.

STEP 1: Apply Good Agronomic Practices

Fertilizer use is only recommended if some minimal good agronomic practices are upheld:

- Always use improved varieties that are disease-tolerant, for example TME 419, TMS 30572 or TMS 98-0581.
- We advise obtaining disease-free cuttings from a certified source.
- Plant in lines of 1 m between rows and 80 cm within row (5,000 plants per acre).
- Practice good land preparation and weed control. See our recommendations on "Six Steps to Cassava Weed Management and Planting Practices".

STEP 2: Choose the Best Fertilizer

Cassava requires different nutrients to grow. The 3 most important nutrients are:

- Nitrogen** is required for the growth of stems and leaves.
- Phosphorus** provides the crop with the energy needed for growth.
- Potassium** is required for the bulking of the storage roots.

Some fertilizers supply all 3 of these nutrients (e.g. NPK 15:15:15, NPK 17:17:17 or NPK 20:10:10) while other fertilizers only supply 1 or 2 of these nutrients (e.g. urea 46:0:0, DAP 18:46:0 and MOP 0:0:60).

Cassava requires all 3 of these nutrients, but the amounts depend on the fertility of the soil and the planting date. For this reason, a combination of fertilizers is preferred over a single complex fertilizer. In this tool, we will focus on the use of commonly available fertilizers: Urea and NPK 15:15:15.

STEP 3: Decide the Fertilizer Application Rate

The amount of fertilizer to apply depends on your current cassava yield. Think of how cassava performed in your field in the past, and compare the size of the root stock to the pictures.

Illustrations show a woman holding cassava roots, with five categories of yield: LOW (<3 tonnes per acre), NORMAL (3 - 6 tonnes per acre), MEDIUM (6 - 9 tonnes per acre), HIGH (9 - 12 tonnes per acre), and VERY HIGH (>12 tonnes per acre).

The higher your current yield, the less fertilizer is required. Use the flyer with maps and tables to obtain the fertilizer rate for your LGA, month of planting and current yield level. Recommendations are provided in kilograms of urea and NPK fertilizer per acre. Convert these to rates required for your field using the calculations below.

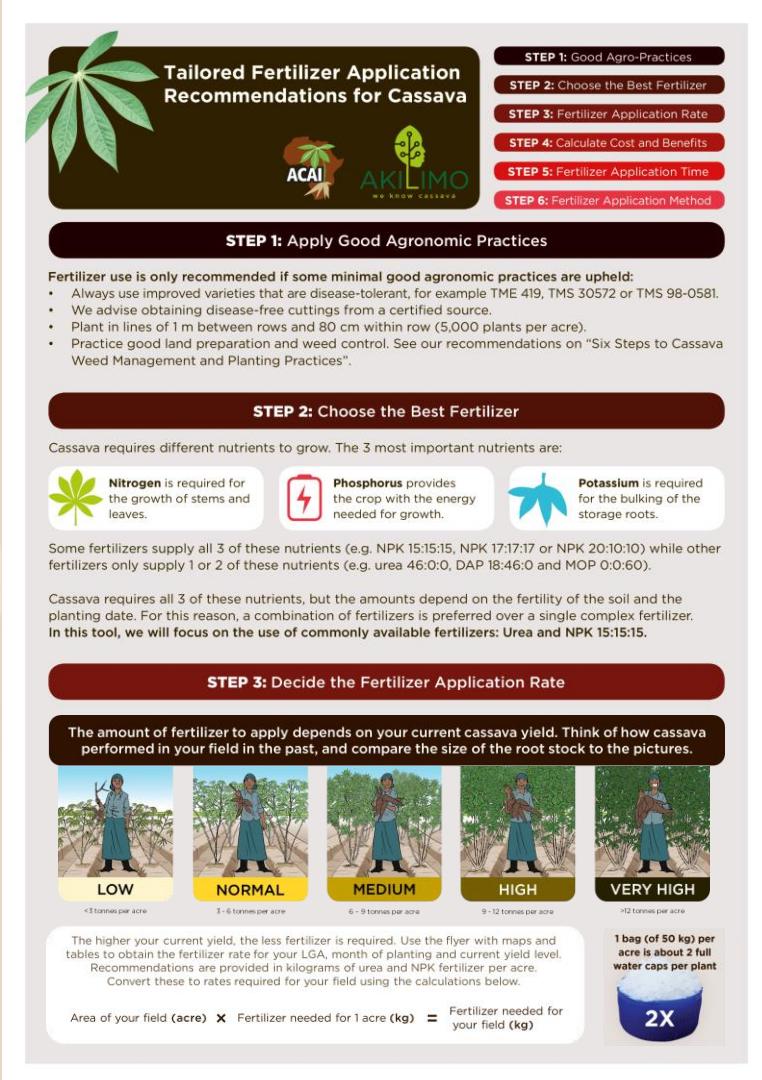
Area of your field (acre) \times Fertilizer needed for 1 acre (kg) = Fertilizer needed for your field (kg)

1 bag (of 50 kg) per acre is about 2 full water caps per plant

2X

You will use

AKILIMO guide



Tailored Fertilizer Application Recommendations for Cassava

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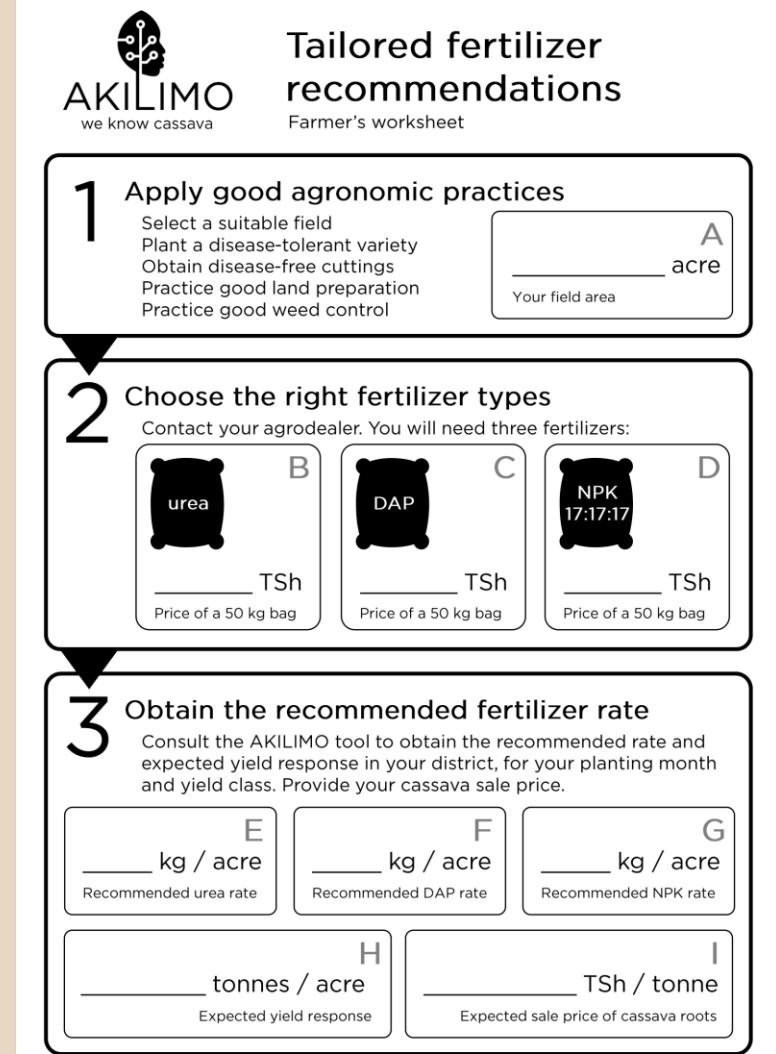
| Yield Level | Approximate Yield (tonnes per acre) | Root Stock Size |
|-------------|-------------------------------------|-----------------------|
| LOW | <3 tonnes per acre | Small root stock |
| NORMAL | 3 - 6 tonnes per acre | Medium root stock |
| MEDIUM | 6 - 9 tonnes per acre | Medium root stock |
| HIGH | 9 - 12 tonnes per acre | Large root stock |
| VERY HIGH | >12 tonnes per acre | Very large root stock |

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Area of your field (acre) \times Fertilizer needed for 1 acre (kg) = Fertilizer needed for your field (kg)

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2X

Farmer's worksheet



AKILIMO
we know cassava

Tailored fertilizer recommendations
Farmer's worksheet

1 Apply good agronomic practices

Select a suitable field
Plant a disease-tolerant variety
Obtain disease-free cuttings
Practice good land preparation
Practice good weed control

A acre
Your field area

2 Choose the right fertilizer types

Contact your agrodealer. You will need three fertilizers:

| Fertilizer Type | Label | Price per 50 kg bag |
|-----------------|-------|---------------------|
| urea | B | TSh |
| DAP | C | TSh |
| NPK 17:17:17 | D | TSh |

Price of a 50 kg bag

3 Obtain the recommended fertilizer rate

Consult the AKILIMO tool to obtain the recommended rate and expected yield response in your district, for your planting month and yield class. Provide your cassava sale price.

| Rate | Label | Value | Description |
|---------------|-------|---------------|--------------------------------------|
| kg / acre | E | kg / acre | Recommended urea rate |
| kg / acre | F | kg / acre | Recommended DAP rate |
| kg / acre | G | kg / acre | Recommended NPK rate |
| tonnes / acre | H | tonnes / acre | Expected yield response |
| TSh / tonne | I | TSh / tonne | Expected sale price of cassava roots |

You will use

Flyer with fertilizer rates



Recommended Fertilizer Rates

MWANZA
SHINYANGA
SIMIYU
(or your region)

This tool contains tables and maps with advice on application rates of urea, DAP, NPK 17:17:17 fertilizer for cassava. Response to fertilizer depends on soil conditions, the time of planting and your yield class. Tables are provided that specify the recommended fertilizer application rates by district, month of planting, and your yield class, as well as the expected root yield response. Maps are also provided to show how fertilizer rates vary across the region.

AKILIMO guide

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1 bag (of 50 kg) per acre is about 2 full water caps per plant

2X

Farmer's worksheet

AKILIMO
we know cassava

Tailored fertilizer recommendations
Farmer's worksheet

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A acre
Your field area

2 Choose the right fertilizer types

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| Fertilizer Type | Label | Unit Price |
|-----------------|-------|------------|
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| DAP | C | TSh |
| NPK 17:17:17 | D | TSh |

Price of a 50 kg bag

3 Obtain the recommended fertilizer rate

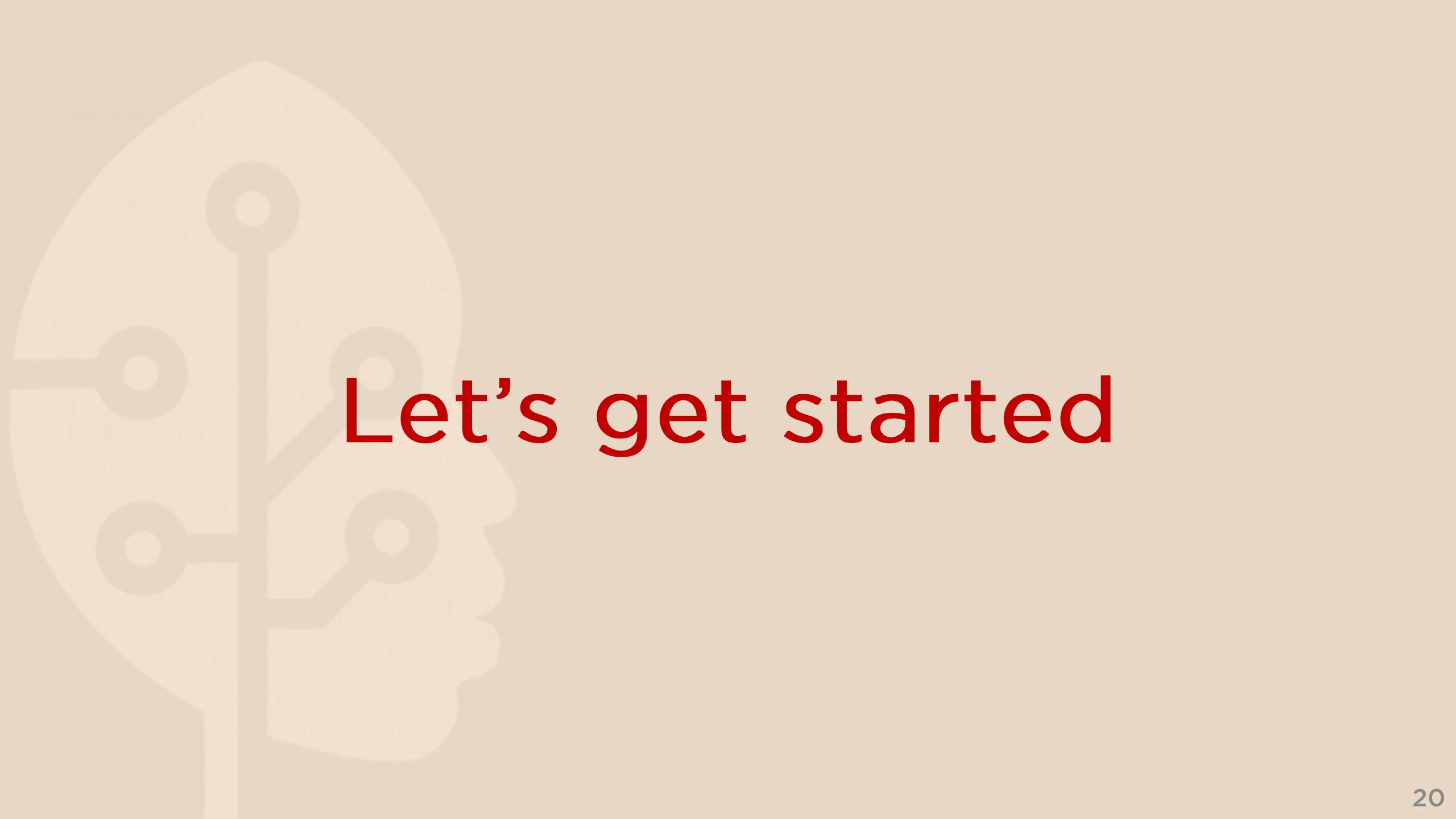
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| Yield Class | Rate (kg / acre) | Rate (TSh / tonne) |
|-------------|------------------|--------------------|
| E | kg / acre | TSh / tonne |
| F | kg / acre | TSh / tonne |
| G | kg / acre | TSh / tonne |

Recommended urea rate
Recommended DAP rate
Recommended NPK rate

H tonnes / acre
Expected yield response

I TSh / tonne
Expected sale price of cassava roots



Let's get started

1 Apply good agronomic practices

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Fertilizer use is only recommended if some minimal good agronomic practices are upheld!

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See our video on “Six Steps to Cassava Weed Management and Planting practices”.
- Always use improved varieties that are disease-tolerant.
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- Plant in lines of 1 m between rows.
Space erect varieties at 80 cm within row (5,000 plants per acre).
Space branching varieties at 1 m within row (4,000 plants per acre).

1 Apply good agronomic practices

Fertilizer use is only recommended if some minimal good agronomic practices are upheld!

1

Apply good agronomic practices

- Select a suitable field
- Plant a disease-tolerant variety
- Obtain disease-free cuttings
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1

Apply good agronomic practices

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- Obtain disease-free cuttings
- Practice good land preparation
- Practice good weed control

A
_____ acre
Your field area

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1

Apply good agronomic practices

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- Practice good weed control

1.25 acre A
Your field area

2 Choose the right fertilizer types

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Cassava requires different nutrients to grow. The 3 most important nutrients are:

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Nitrogen is required
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N

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Phosphorus provides the crop with energy needed for growth.

N

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N

P

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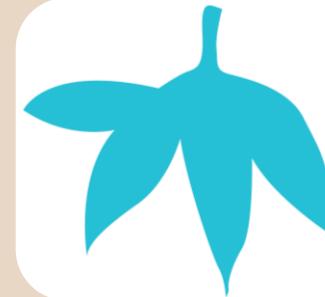
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Potassium is used for the bulking of the storage roots.

N

P

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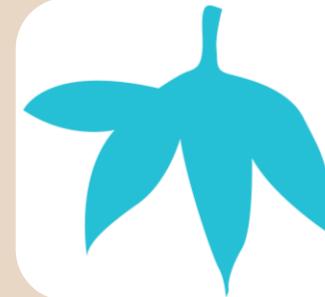
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N

P

K

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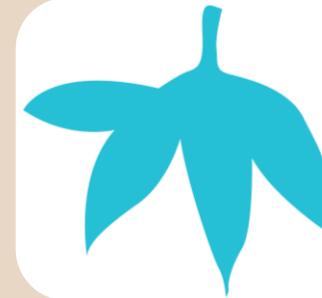
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Some fertilizers supply all 3 of these nutrients:

NPK 15:15:15, NPK 17:17:17, NPK 20:10:10

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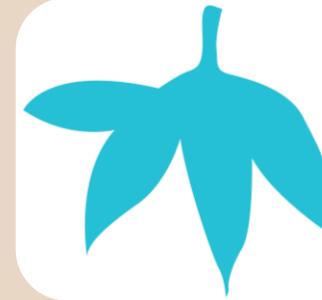
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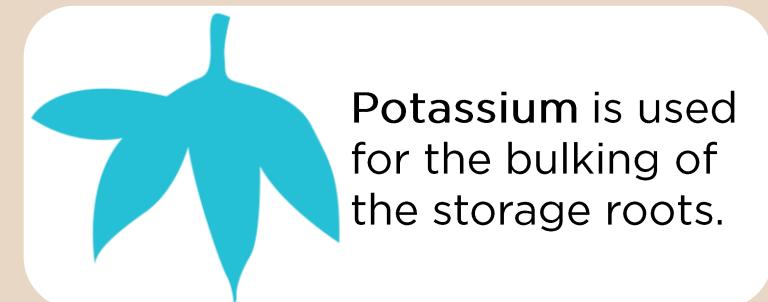
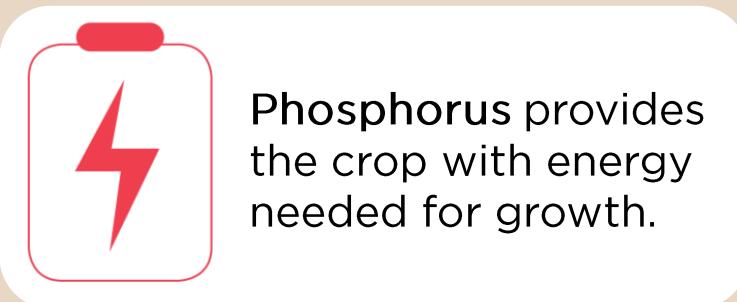
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Other fertilizers only supply 1 or 2 of these nutrients:

urea 46:0:0, DAP 18:46:0, MOP 0:0:60

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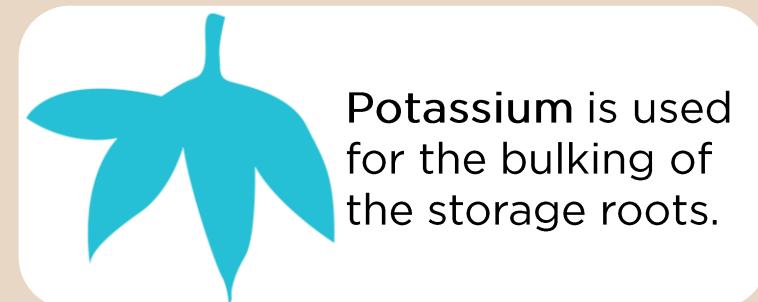
Nitrogen

N



Phosphorus

P



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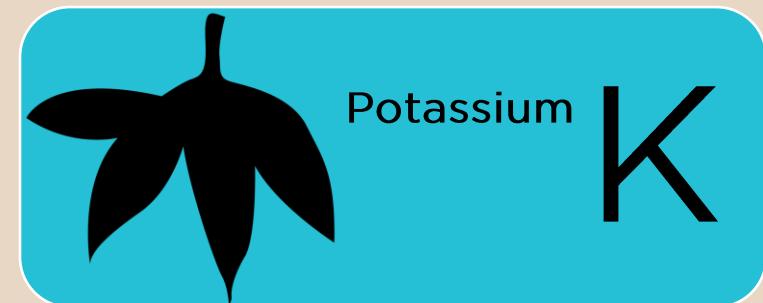
Nitrogen

N



Phosphorus

P



Potassium

K

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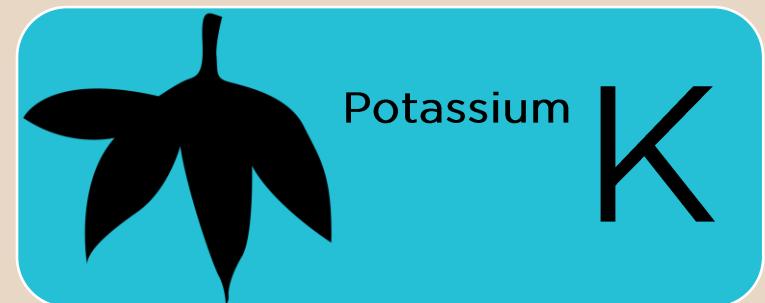
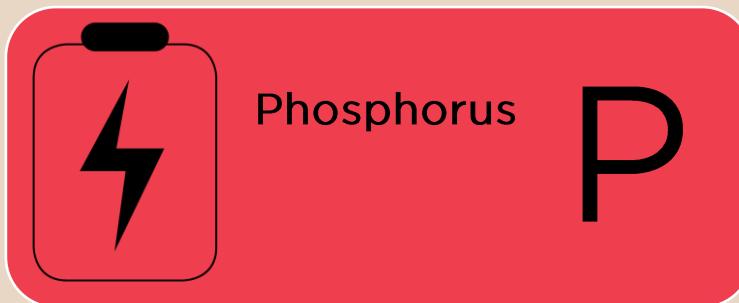
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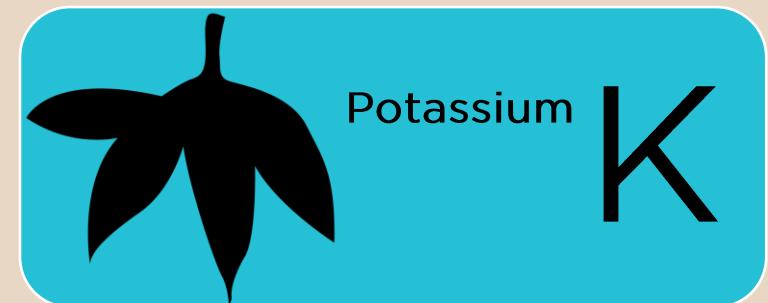
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In this video, we will focus on a combination of 3 commonly available fertilizers:

urea 46:0:0 + DAP 18:46:0 + NPK 17:17:17

2 Choose the right fertilizer types

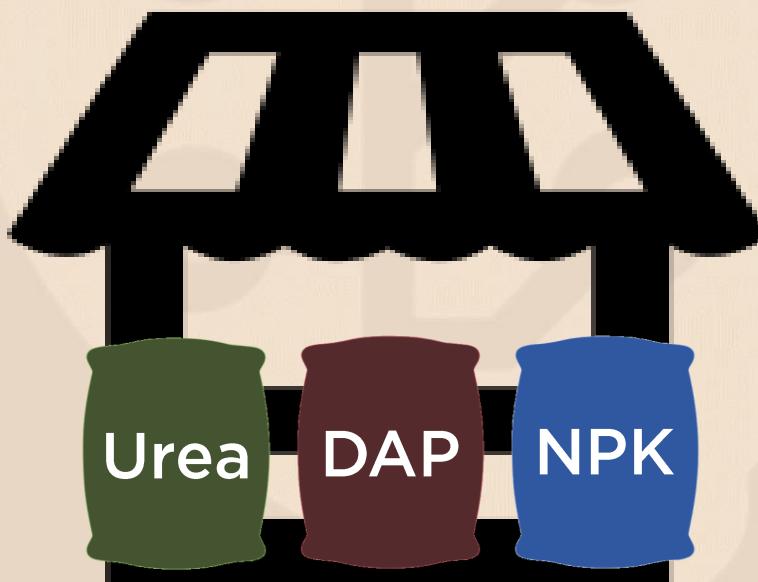
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Ask your local agrodealer for the prices of urea and NPK 17:17:17.

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urea 46:0:0 + DAP 18:46:0 + NPK 17:17:17

The worksheet collects price information for these three fertilizers:

2 Choose the right fertilizer types

Contact your agrodealer. You will need three fertilizers:

| | | |
|--|---|--|
|  urea | B | <hr/> TSh Price of a 50 kg bag |
|--|---|--|

| | | |
|---|---|--|
|  DAP | C | <hr/> TSh Price of a 50 kg bag |
|---|---|--|

| | | |
|---|---|--|
|  NPK 17:17:17 | D | <hr/> TSh Price of a 50 kg bag |
|---|---|--|

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B
urea
50,000 TSh
Price of a 50 kg bag



C
DAP
_____ TSh
Price of a 50 kg bag



D
NPK
17:17:17
_____ TSh
Price of a 50 kg bag

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Contact your agrodealer. You will need three fertilizers:

B



urea

50,000 TSh

Price of a 50 kg bag

C



DAP

70,000 TSh

Price of a 50 kg bag

D



NPK
17:17:17

_____ TSh

Price of a 50 kg bag

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urea

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C



DAP

70,000 TSh

Price of a 50 kg bag

D



NPK
17:17:17

60,000 TSh

Price of a 50 kg bag

3 Obtain the recommended fertilizer rate

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The amount of fertilizer to apply depends on your current cassava yield.

3 Obtain the recommended fertilizer rate

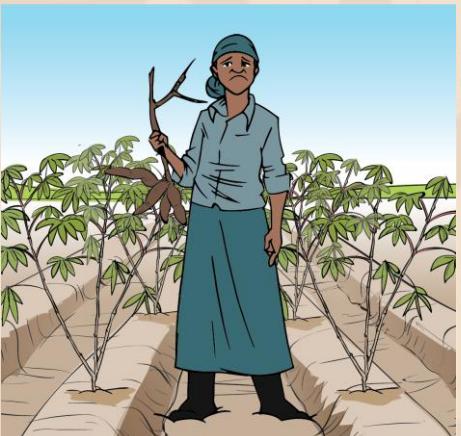
The amount of fertilizer to apply depends on your current cassava yield.

Think of how cassava performed in your field in the past, and compare the size of a typical root stock harvested from your field to the rootstocks shown in these pictures.

3 Obtain the recommended fertilizer rate

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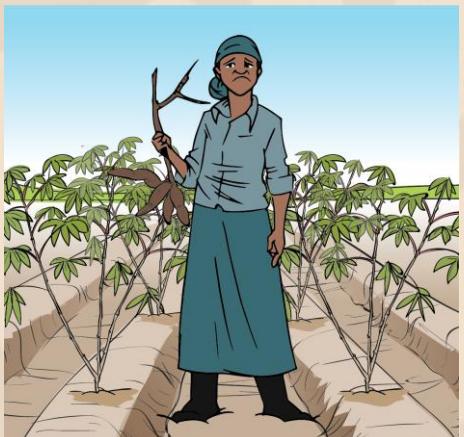
LOW

<3 tonnes per acre

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LOW



NORMAL

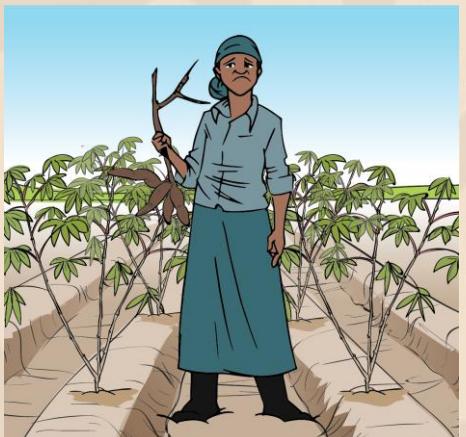
<3 tonnes per acre

3 - 6 tonnes per acre

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LOW

<3 tonnes per acre



NORMAL

3 - 6 tonnes per acre



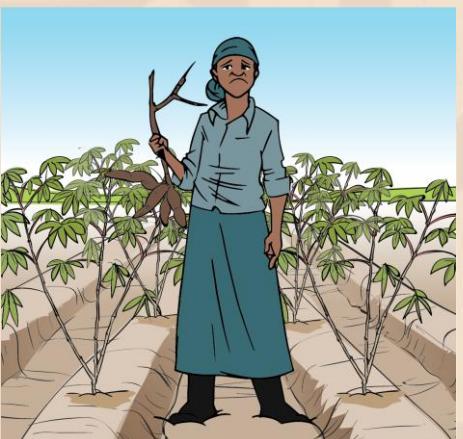
MEDIUM

6 - 9 tonnes per acre

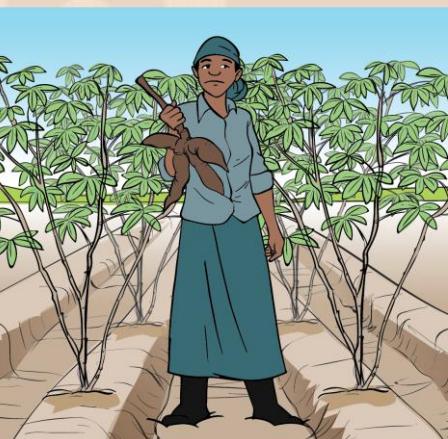
3 Obtain the recommended fertilizer rate

The amount of fertilizer to apply depends on your current cassava yield.

Think of how cassava performed in your field in the past, and compare the size of a typical root stock harvested from your field to the rootstocks shown in these pictures.



LOW



NORMAL



MEDIUM



HIGH

<3 tonnes per acre

3 - 6 tonnes per acre

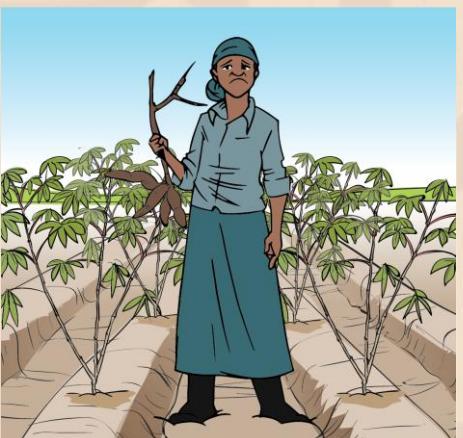
6 - 9 tonnes per acre

9 - 12 tonnes per acre

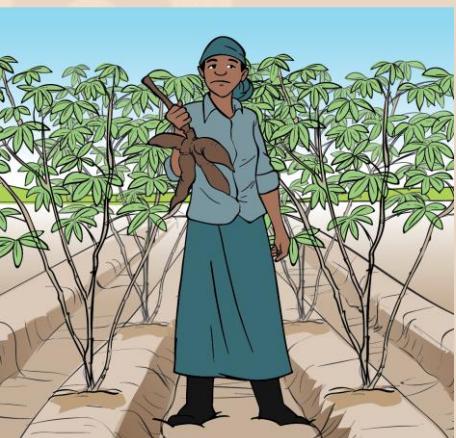
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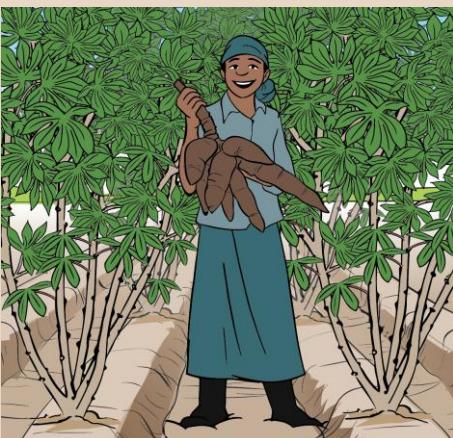
LOW



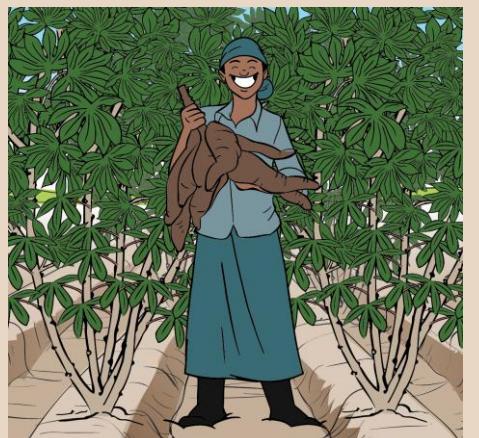
NORMAL



MEDIUM



HIGH



VERY HIGH

<3 tonnes per acre

3 - 6 tonnes per acre

6 - 9 tonnes per acre

9 - 12 tonnes per acre

>12 tonnes per acre

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7.5 - 15 tonnes per hectare

For example

A good crop stand is 4,000 plants per acre.
If every plant yields 1 kg of roots, then your
yield will be:

3 Obtain the recommended fertilizer rate

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$$4,000 \times 1\text{kg} = 4 + / \text{acre}$$

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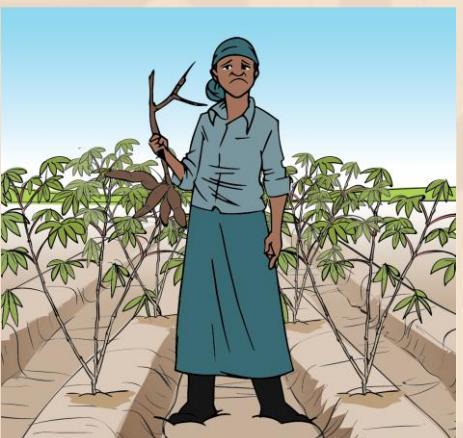
$$4,000 \times 1\text{kg} = 4 + / \text{acre}$$

This is a typical yield for smallholder cassava growers.

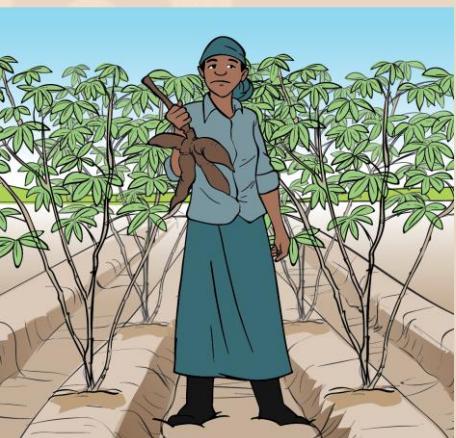
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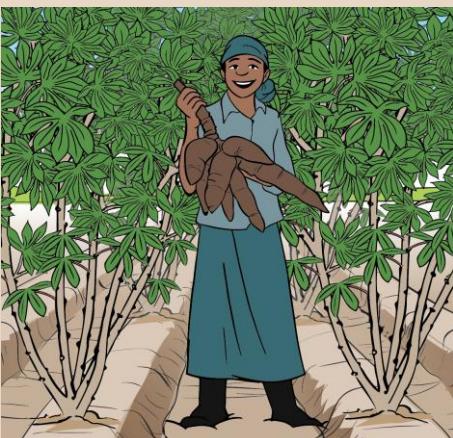
LOW



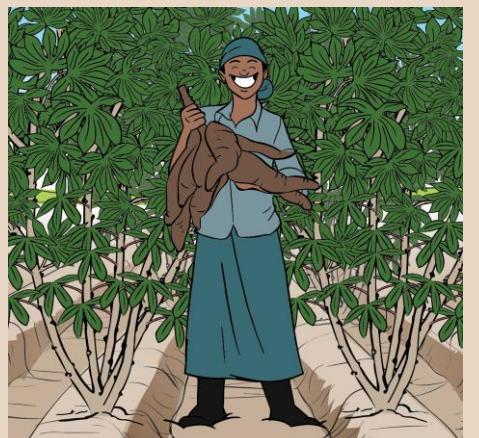
NORMAL



MEDIUM



HIGH



VERY HIGH

<3 tonnes per acre

3 - 6 tonnes per acre

6 - 9 tonnes per acre

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>12 tonnes per acre

The higher your yield, the more productive your soil, and the smaller the fertilizer requirement.

3 Obtain the recommended fertilizer rate

AKILIMO also considers where you are located, and your planting date.

3 Obtain the recommended fertilizer rate

AKILIMO also considers where you are located, and your planting date.

Region / District

AKILIMO uses information about the typical soils in your area to calculate how much nutrients your soil can typically supply.



Different soils require different amounts of fertilizer nutrients.

3 Obtain the recommended fertilizer rate

AKILIMO also considers where you are located, and your planting date.

Region / District

AKILIMO uses information about the typical soils in your area to calculate how much nutrients your soil can typically supply.



Different soils require different amounts of fertilizer nutrients.

Planting month

AKILIMO uses the typical rainfall your crop will receive to calculate how much it can benefit from fertilizer application.



Your planting date affects when and how much rainfall your crop receives.

3 Obtain the recommended fertilizer rate

Use the AKILIMO flyer to look up the recommended fertilizer rate for your current yield level, your region / district, and your planting month.

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Recommended
Fertilizer Rates

www.akilimo.org

MWANZA
SHINYANGA
SIMIYU
(or your region)

The recommended fertilizer rate depends on:

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LOW
NORMAL
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District



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The recommended fertilizer rate depends on:

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LOW
NORMAL
MEDIUM
HIGH
VERY HIGH

District



Planting month



3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

What is your Region?

3 Obtain the recommended fertilizer rate

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How does this work? Let's look at an example.

What is your Region?

Simiyu

What is your District?

Busega

3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

What is your Region?

Simiyu

What is your District?

Busega

In what month will you plant your cassava?

3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

What is your Region?

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What is your District?

Busega

In what month will you plant your cassava?

November

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November

What yield do you typically obtain?

(without fertilizer)

3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

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Busega

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What yield do you typically obtain?

(without fertilizer)



3 Obtain the recommended fertilizer rate

How does this work? Let's look at an example.

What is your Region?

Simiyu

What is your District?

Busega

In what month will you plant your cassava?

November

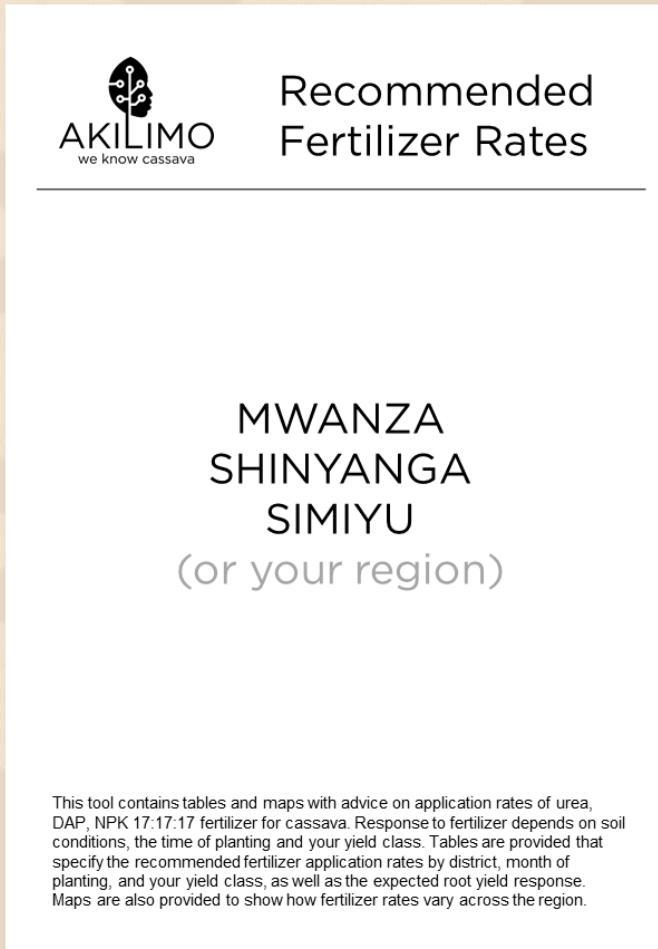
What yield do you typically obtain?

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3 Obtain the recommended fertilizer rate

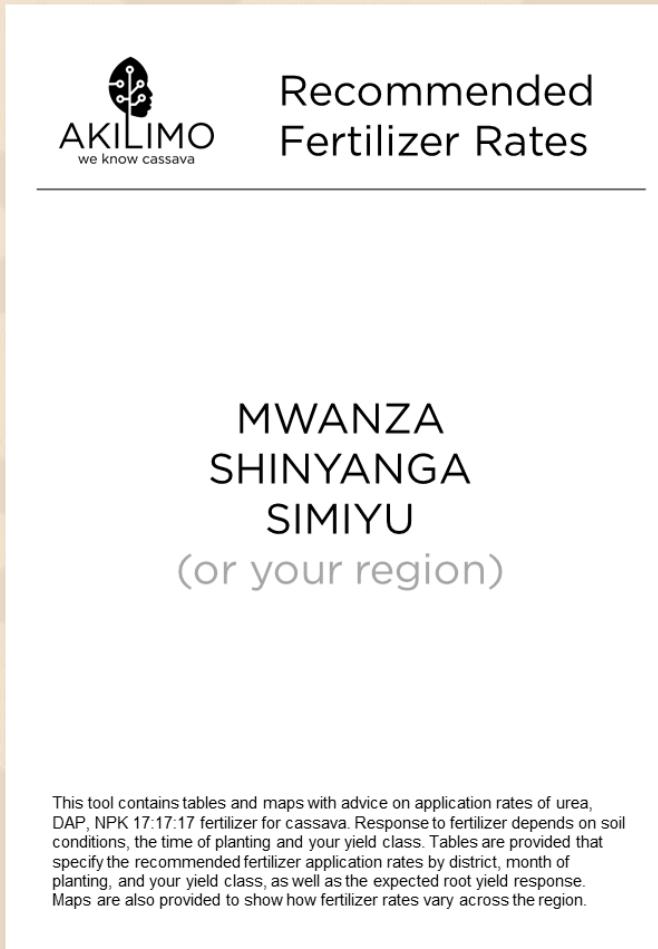
Let's look at the flyer...



AKILIMO provides a flyer that contains the recommended fertilizer rates for your region.

3 Obtain the recommended fertilizer rate

Let's look at the flyer...

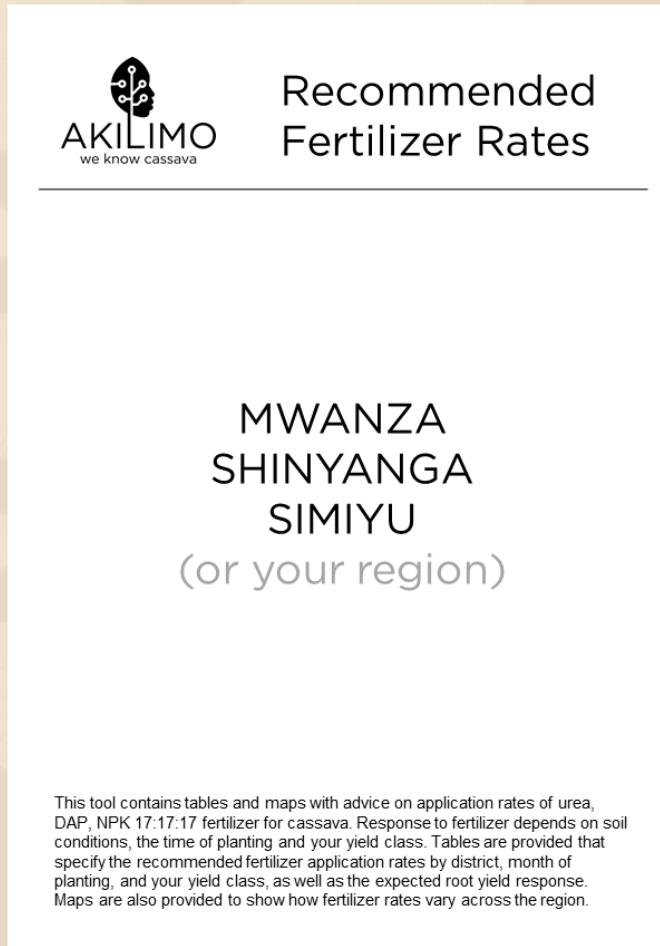


AKILIMO provides a flyer that contains the recommended fertilizer rates **for your region**.

The flyer contains maps and tables that specify the recommended urea, DAP and NPK 17:17:17 rates **per district, planting month and yield class**.

3 Obtain the recommended fertilizer rate

Let's look at the flyer...



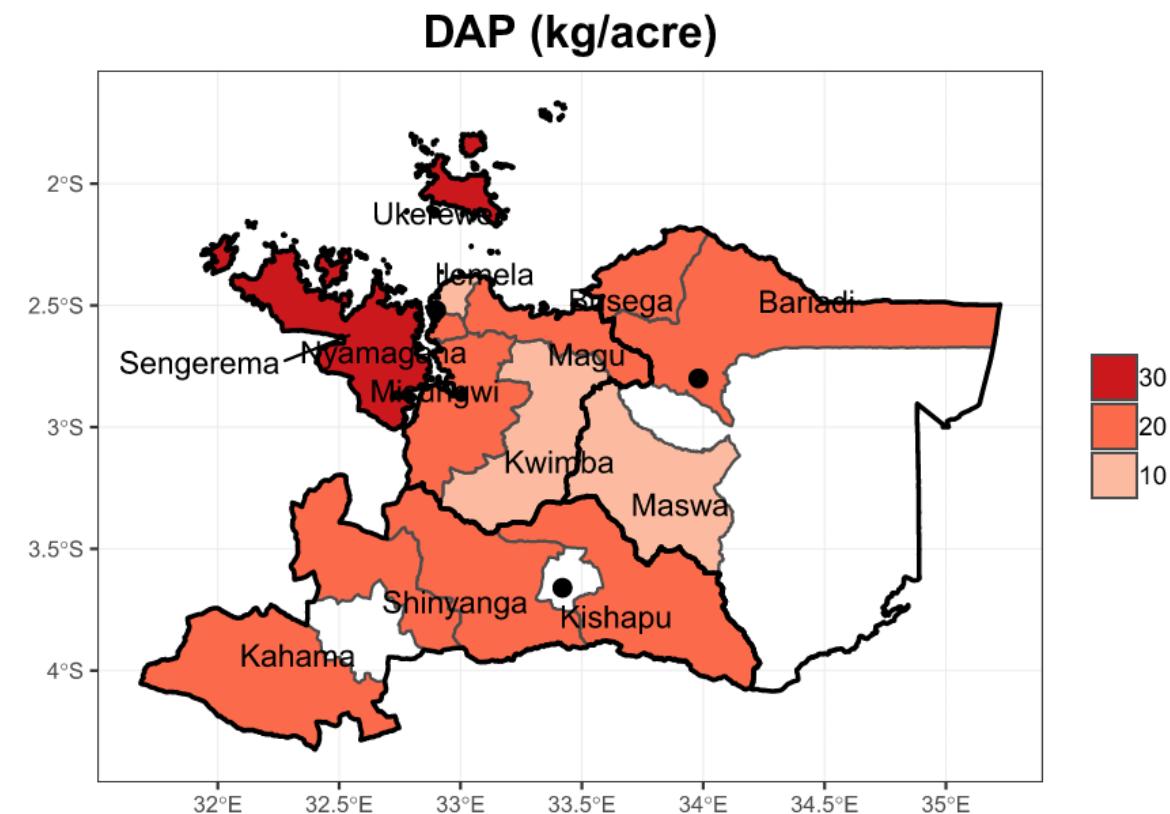
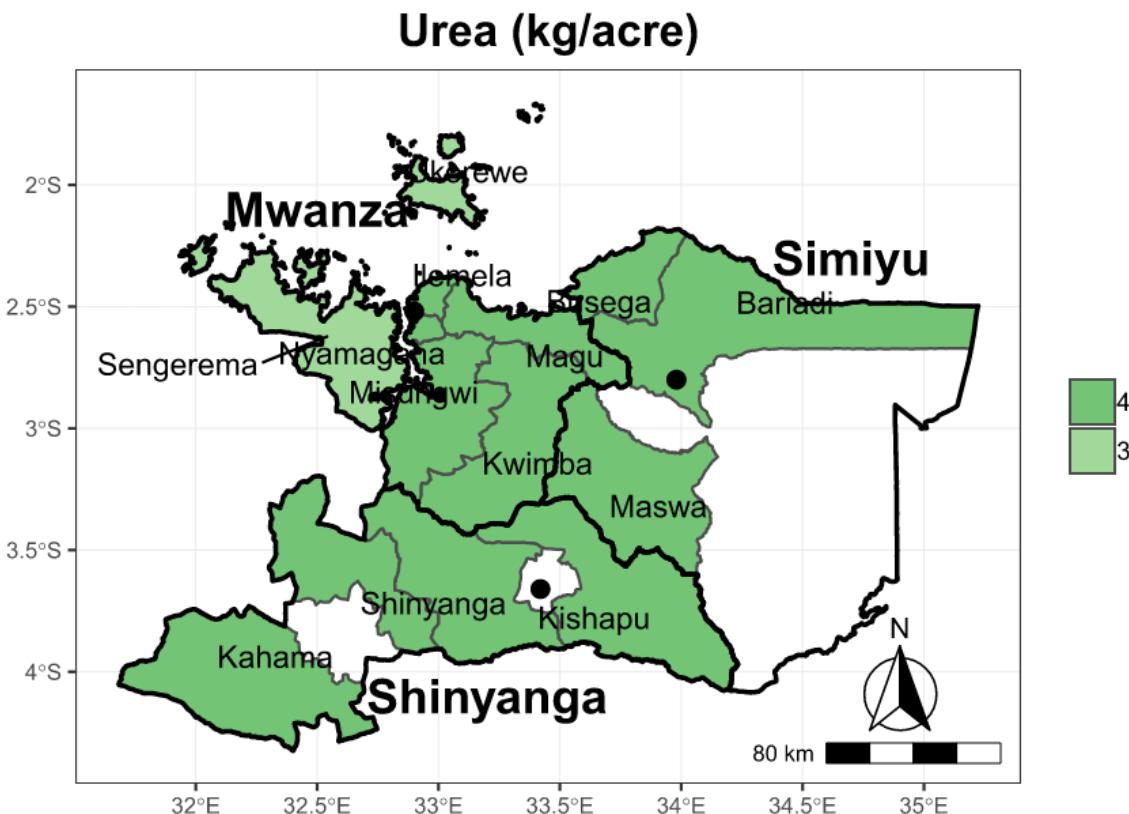
AKILIMO provides a flyer that contains the recommended fertilizer rates for your region.

The flyer contains maps and tables that specify the recommended urea, DAP and NPK 17:17:17 rates per district, planting month and yield class.

So for our example, we look for recommendations for **Busega, Simiyu**, when planting in **November**, in a field with typically **normal yield**.

3 Obtain the recommended fertilizer rate

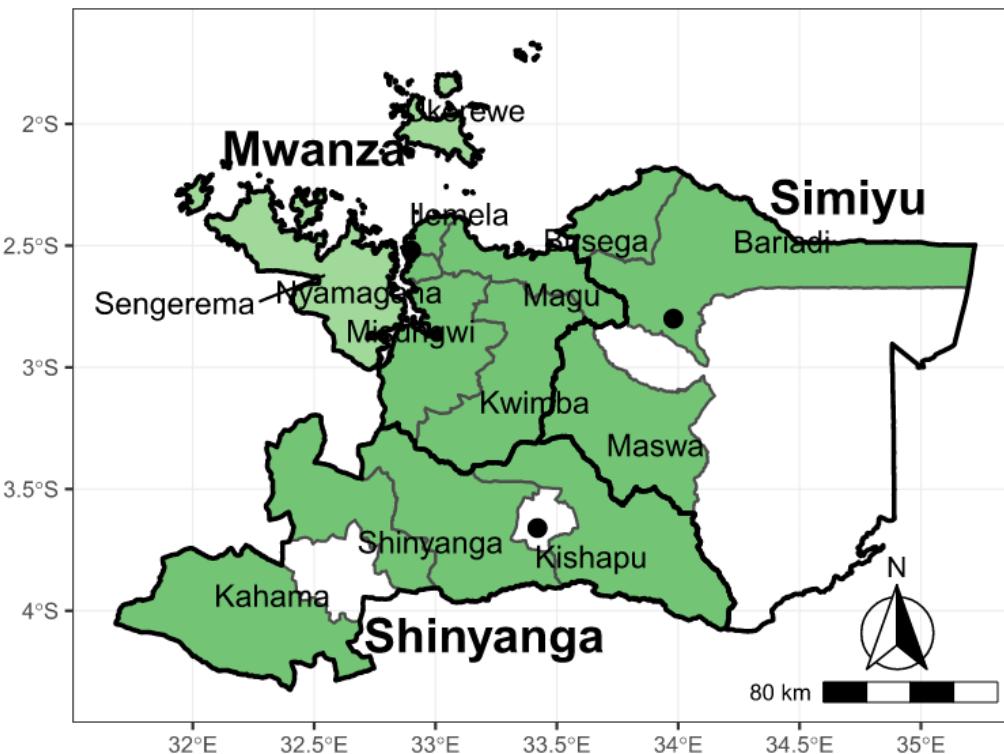
Simiyu region ; planting in November ; yield class = **NORMAL**



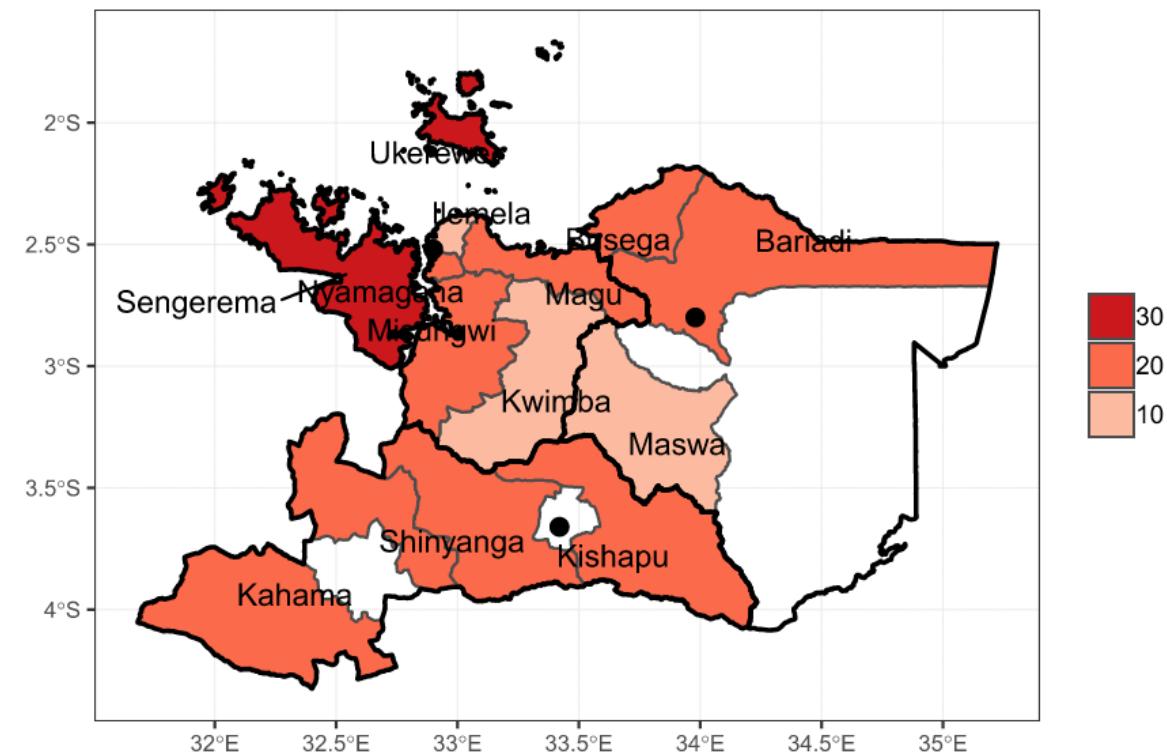
3 Obtain the recommended fertilizer rate

Simiyu region ; planting in November ; yield class = **NORMAL**

Urea (kg/acre)



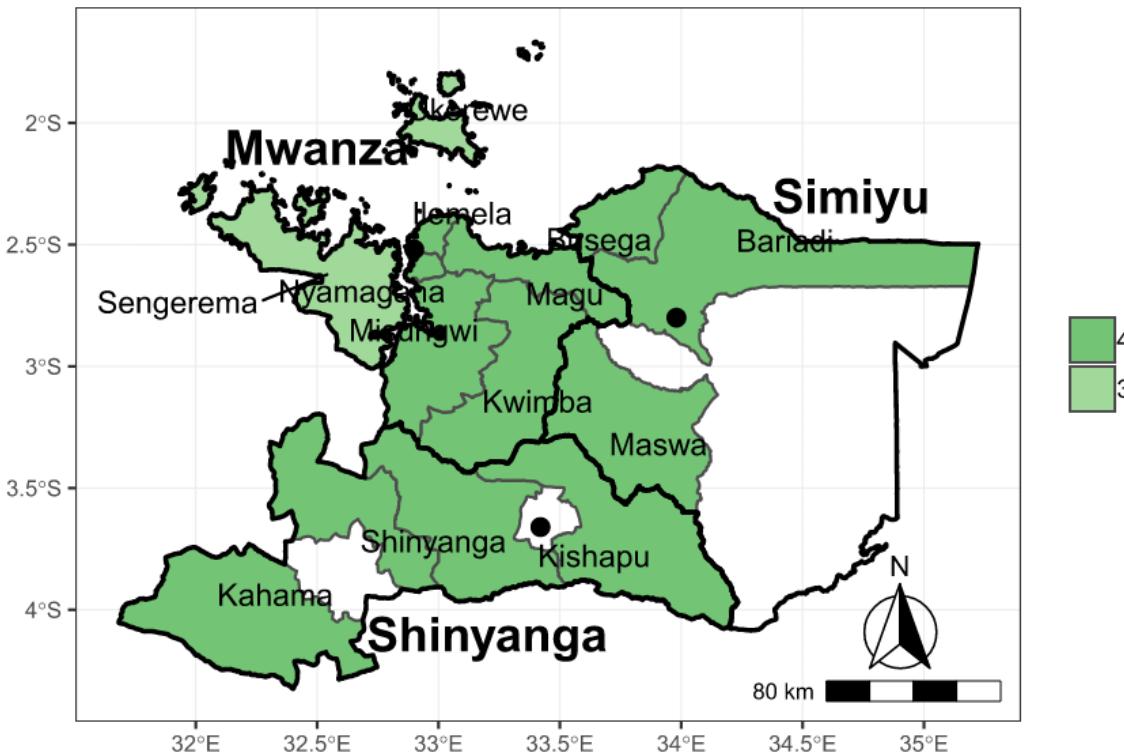
DAP (kg/acre)



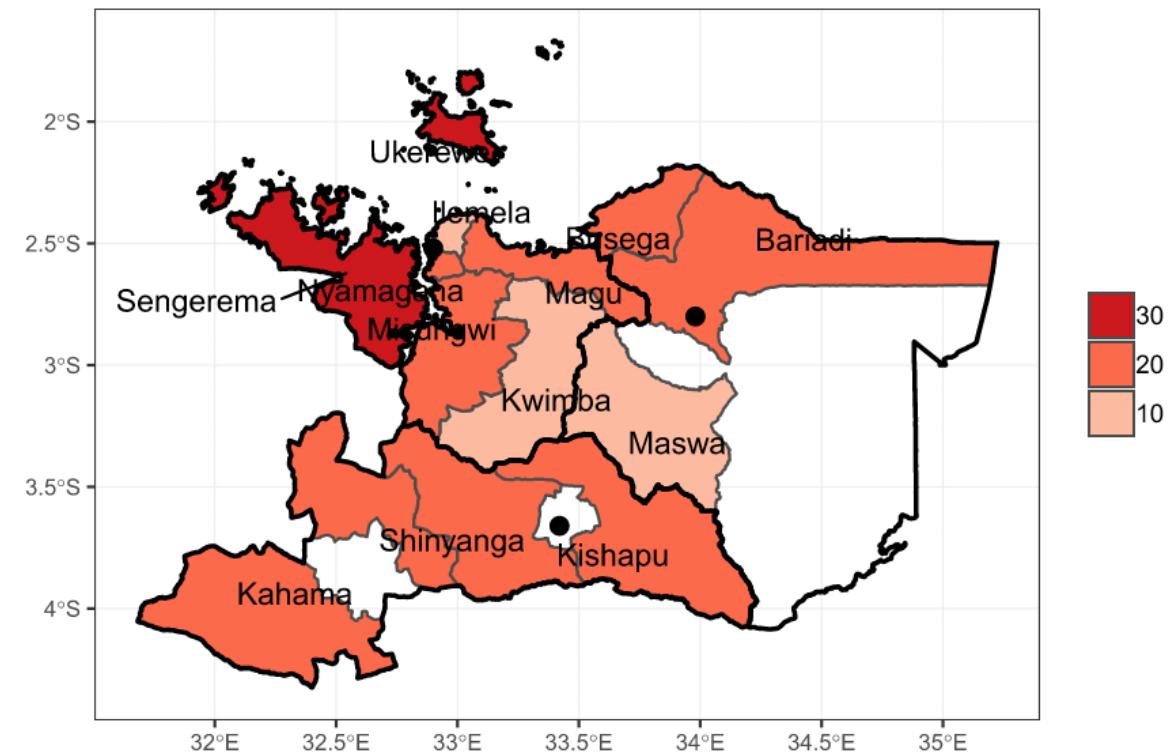
3 Obtain the recommended fertilizer rate

Simiyu region ; planting in November ; yield class = **NORMAL**

Urea (kg/acre)

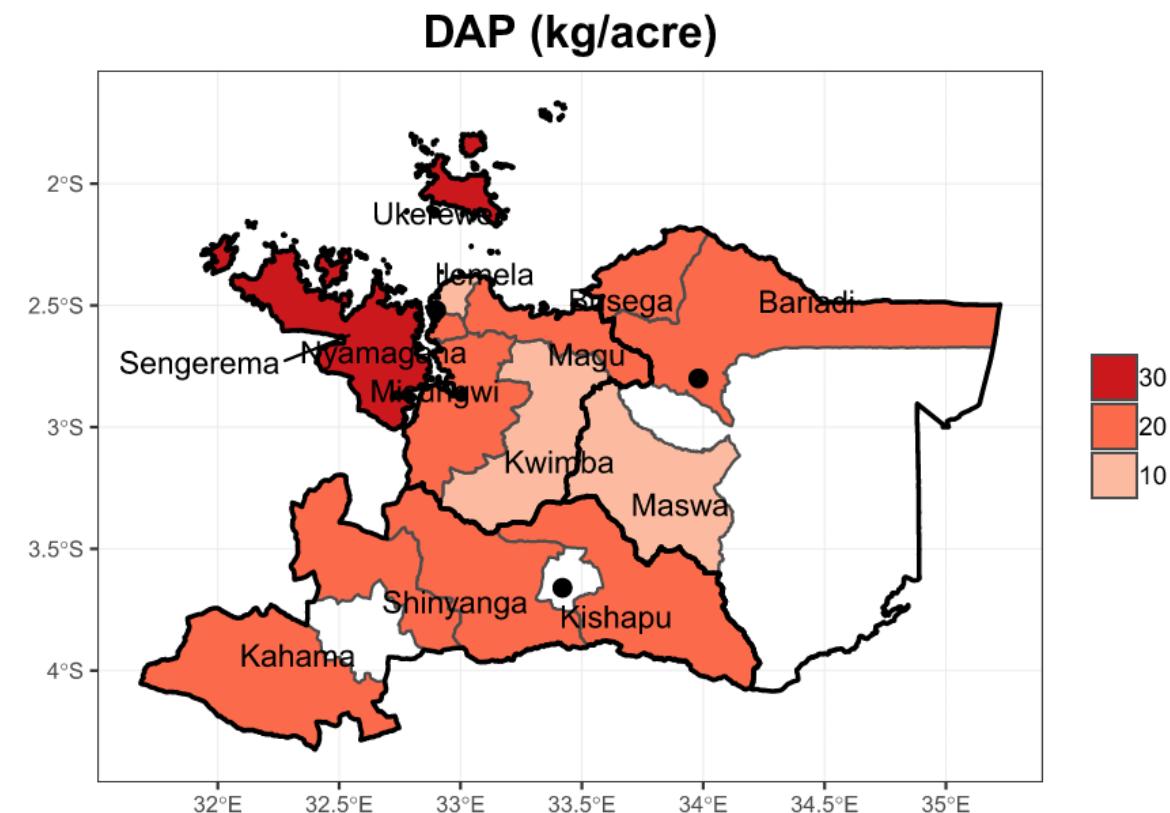
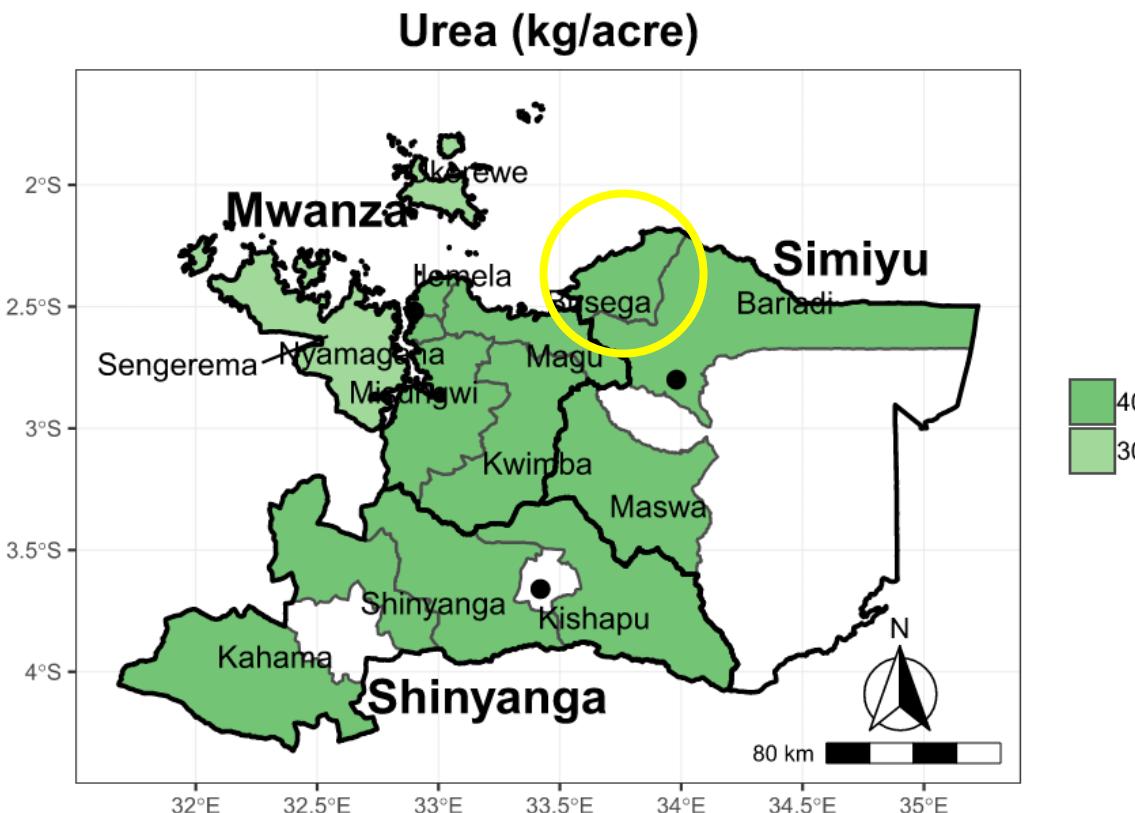


DAP (kg/acre)



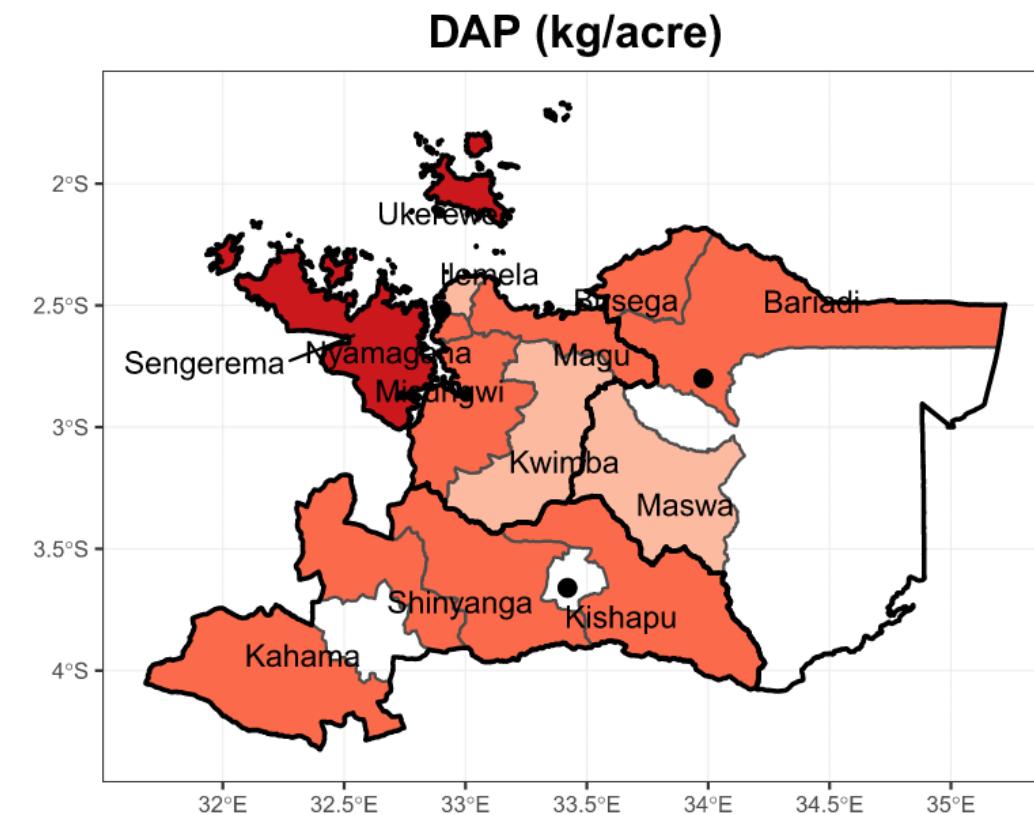
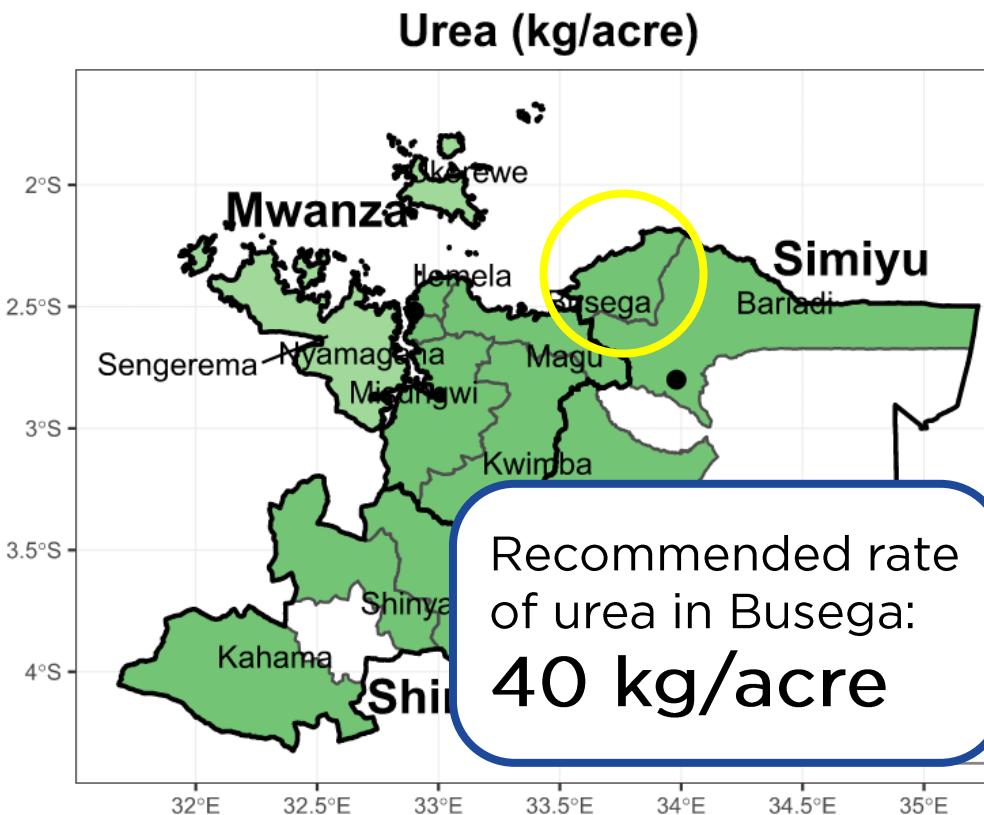
3 Obtain the recommended fertilizer rate

Simiyu region ; planting in November ; yield class = **NORMAL**



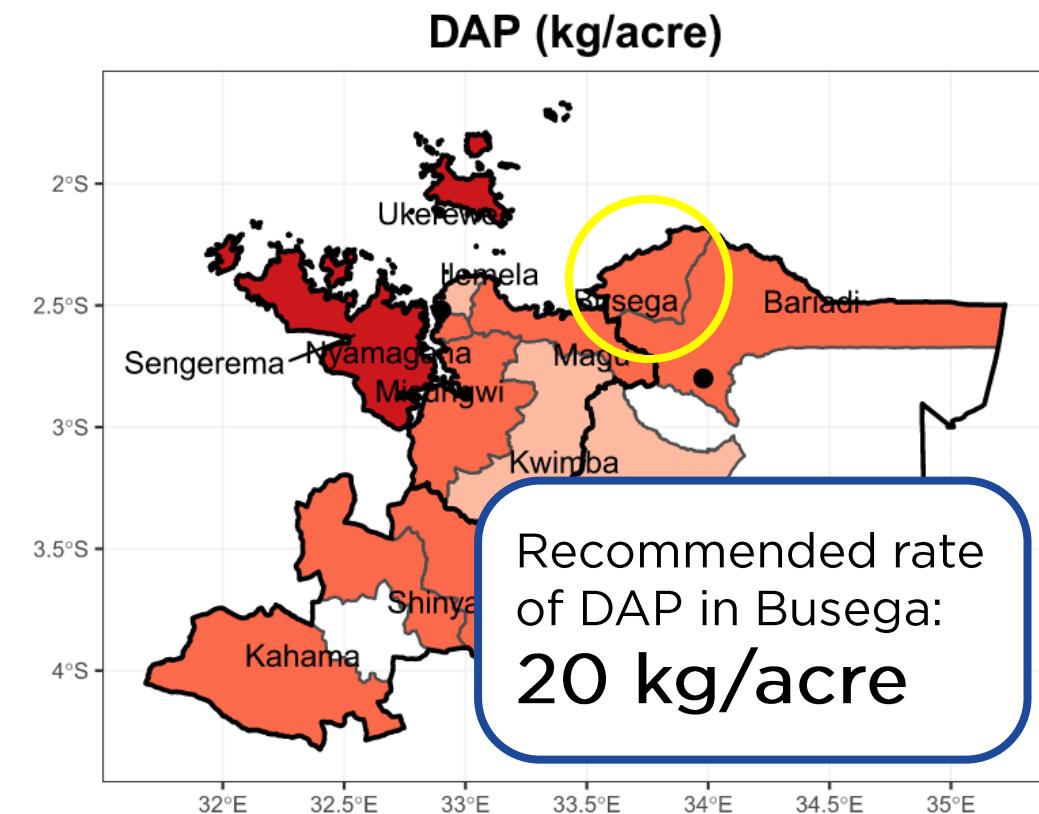
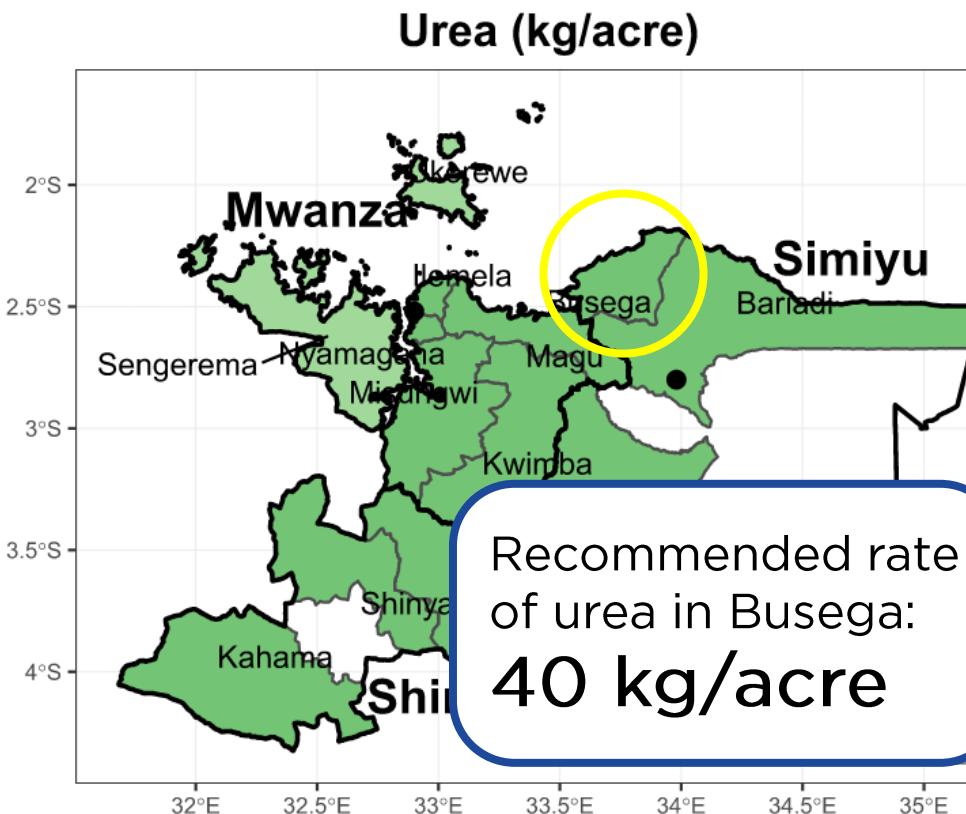
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Simiyu region ; planting in November ; yield class = **NORMAL**



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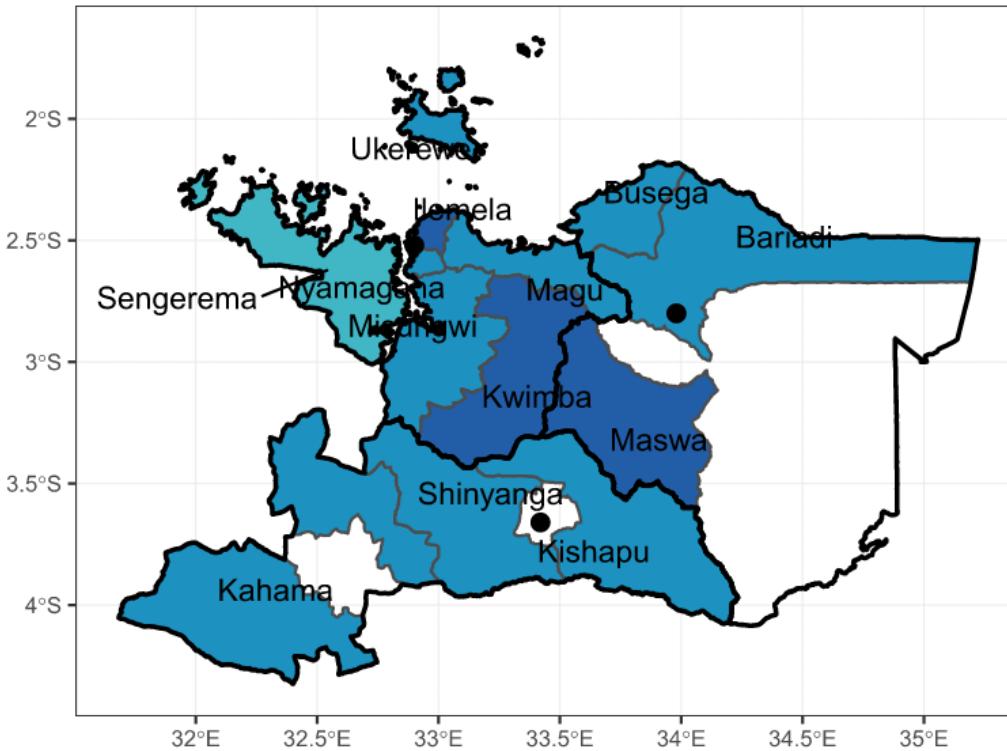
Simiyu region ; planting in November ; yield class = **NORMAL**



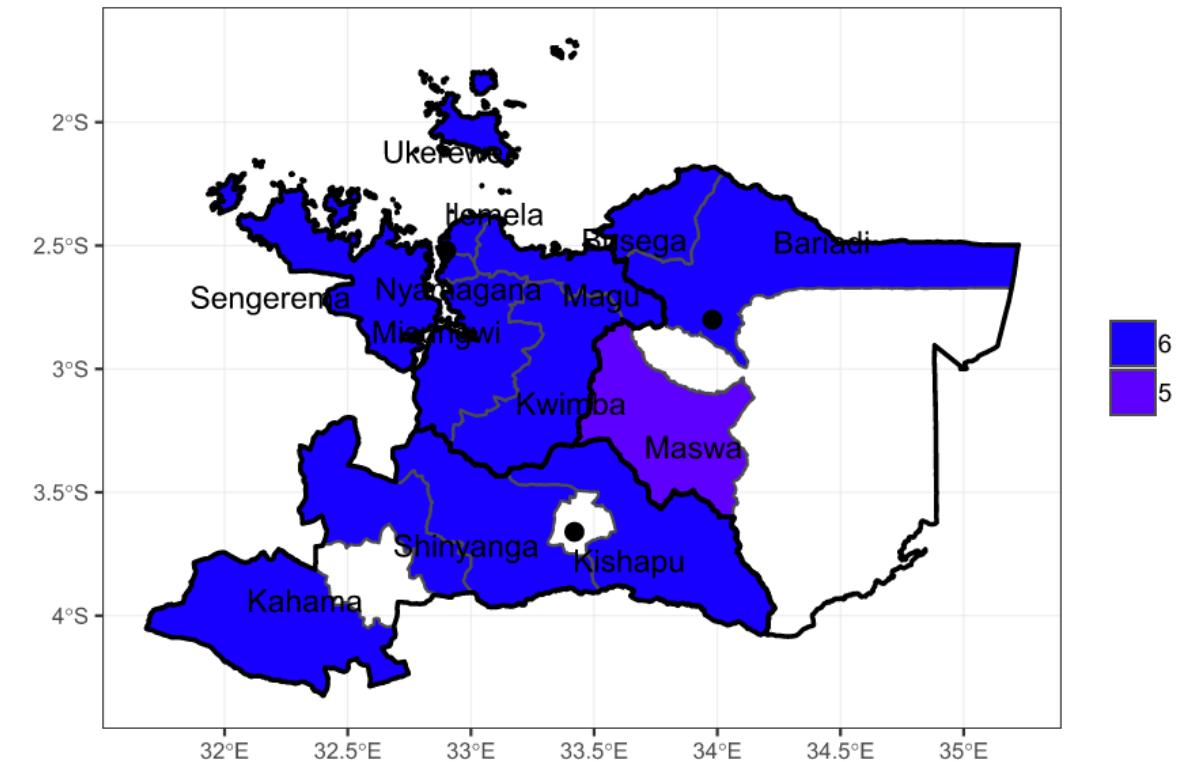
3 Obtain the recommended fertilizer rate

Simiyu region ; planting in November ; yield class = **NORMAL**

NPK17:17:17 (kg/acre)



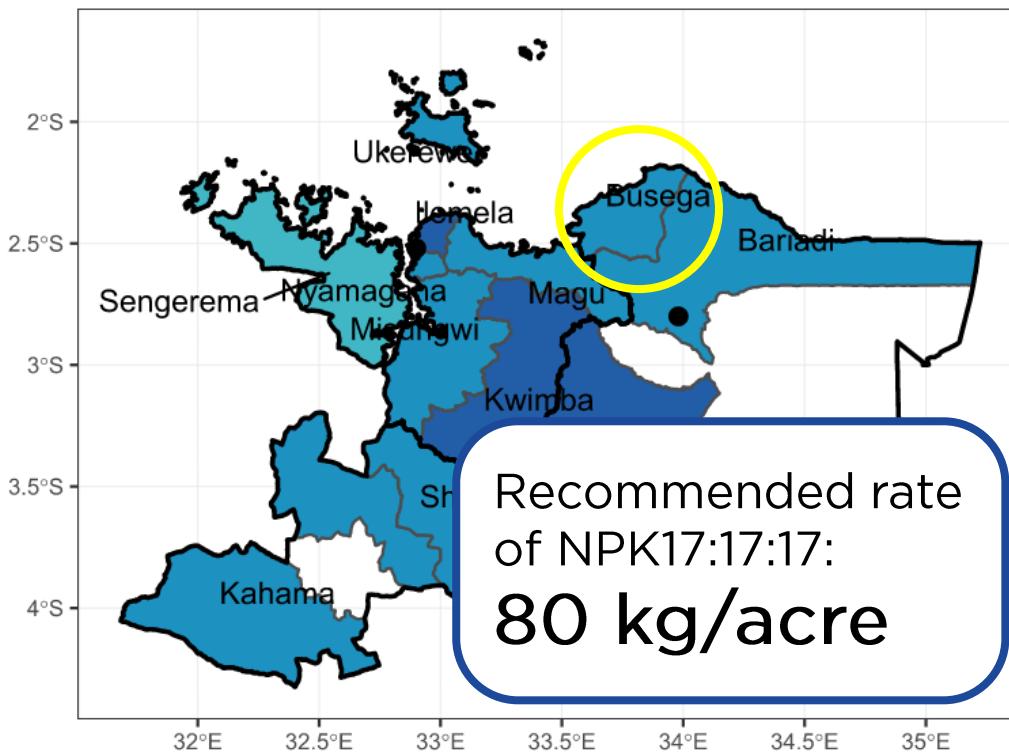
Yield increase (t/acre)



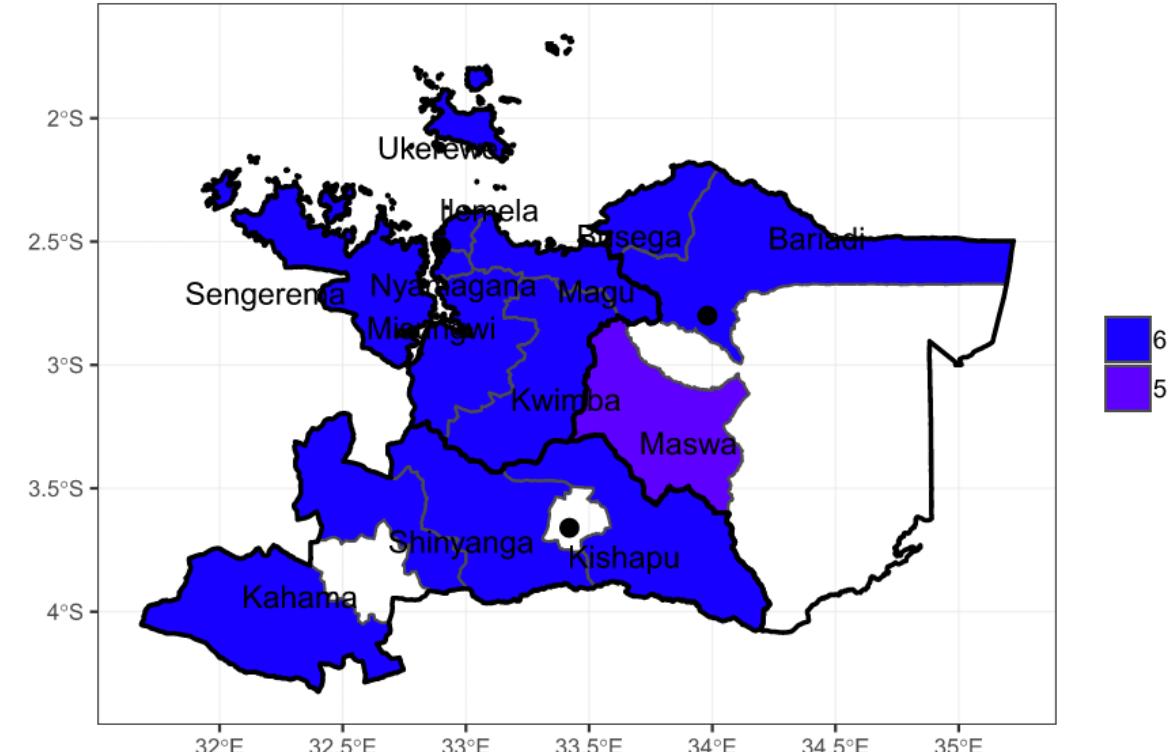
3 Obtain the recommended fertilizer rate

Simiyu region ; planting in November ; yield class = **NORMAL**

NPK17:17:17 (kg/acre)



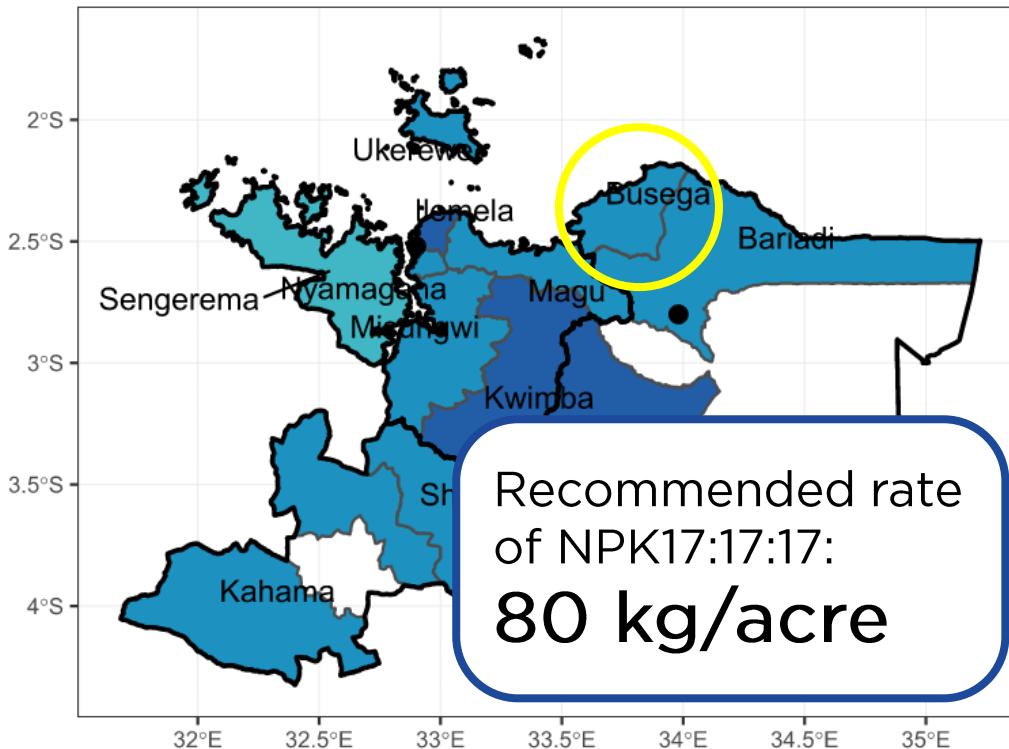
Yield increase (t/acre)



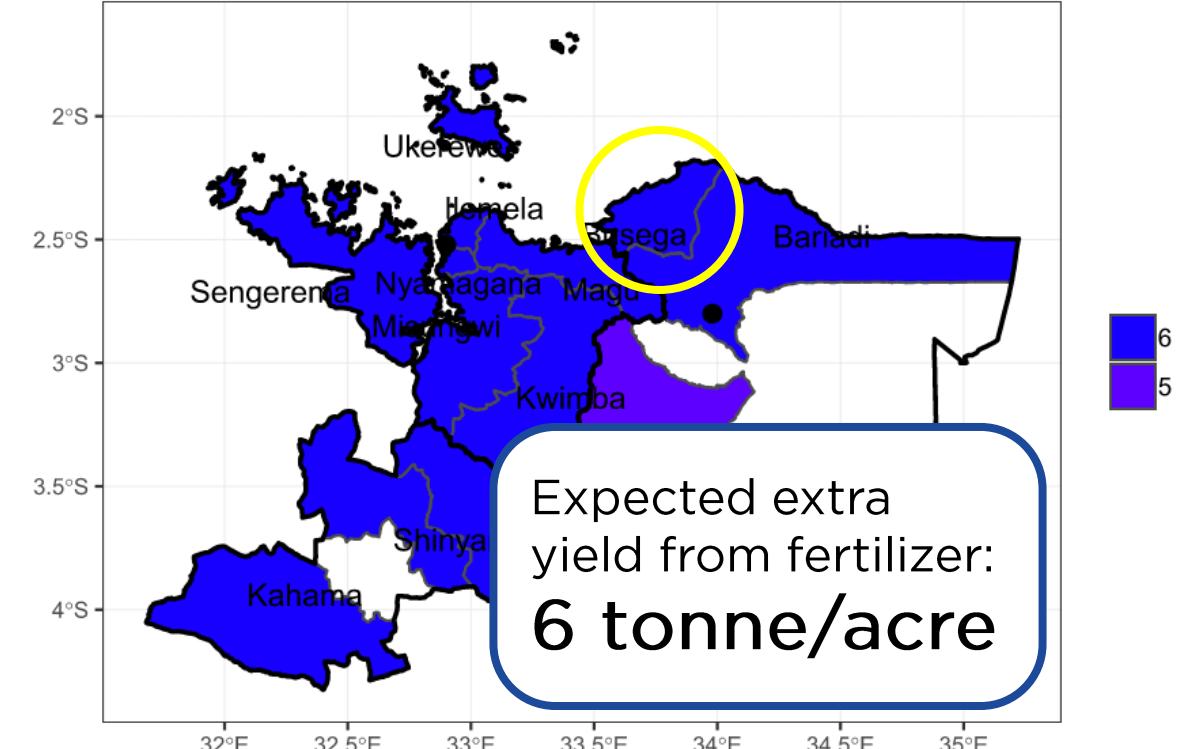
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Simiyu region ; planting in November ; yield class = **NORMAL**

NPK17:17:17 (kg/acre)



Yield increase (t/acre)



3 Obtain the recommended fertilizer rate

The flyer also contains easy look-up tables:

3 Obtain the recommended fertilizer rate

The flyer also contains easy look-up tables:

| REGION | DISTRICT | Planting in November | | NPK17:17:17 (kg/acre) | Current yield: NORMAL (t/acre) |
|-----------|-----------|----------------------|------------------|--------------------------|--------------------------------------|
| | | Urea (kg/acre) | DAP (kg/acre) | | |
| Mwanza | Ilemela | 40 | 10 | 90 | 6 |
| Mwanza | Kwimba | 40 | 10 | 90 | 6 |
| Mwanza | Magu | 40 | 20 | 80 | 6 |
| Mwanza | Misungwi | 40 | 20 | 80 | 6 |
| Mwanza | Nyamagana | 40 | 20 | 80 | 6 |
| Mwanza | Sengerema | 30 | 30 | 70 | 6 |
| Mwanza | Ukerewe | 30 | 30 | 80 | 6 |
| Shinyanga | Kahama | 40 | 20 | 80 | 6 |
| Shinyanga | Kishapu | 40 | 20 | 80 | 6 |
| Shinyanga | Shinyanga | 40 | 20 | 80 | 6 |
| Simiyu | Bariadi | 40 | 20 | 80 | 6 |

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| Shinyanga | Kahama | 40 | 20 | 80 | 6 |
| Shinyanga | Kishapu | 40 | 20 | 80 | 6 |
| Shinyanga | Shinyanga | 40 | 20 | 80 | 6 |
| Simiyu | Bariadi | 40 | 20 | 80 | 6 |
| Simiyu | Busega | 40 | 20 | 80 | 6 |
| Simiyu | Maswa | 40 | 10 | 90 | 5 |

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Recommended rate
of urea in Busega:
40 kg/acre

Recommended rate
of DAP in Busega:
20 kg/acre

Recommended rate
of NPK17:17:17:
80 kg/acre

Expected extra
yield from fertilizer:
6 tonne/acre

3 Obtain the recommended fertilizer rate

3

Obtain the recommended fertilizer rate

Consult the AKILIMO tool to obtain the recommended rate and expected yield response in your district, for your planting month and yield class. Provide your cassava sale price.

E
_____ kg / acre

Recommended urea rate

F
_____ kg / acre

Recommended DAP rate

G
_____ kg / acre

Recommended NPK rate

H
_____ tonnes / acre

Expected yield response

I
_____ TSh / tonne

Expected sale price of cassava roots

Recommended rate
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Recommended rate
of NPK17:17:17:

80 kg/acre

Expected extra
yield from fertilizer:

6 tonne/acre

For the cost benefit analysis in Step 4, you need to provide the price you expect to receive for 1 tonne of cassava roots.

3 Obtain the recommended fertilizer rate

3

Obtain the recommended fertilizer rate

Consult the AKILIMO tool to obtain the recommended rate and expected yield response in your district, for your planting month and yield class. Provide your cassava sale price.

40 kg / acre

Recommended urea rate

E

20 kg / acre

Recommended DAP rate

F

80 kg / acre

Recommended NPK rate

G

6 tonnes / acre

Expected yield response

H

100,000 TSh / tonne

Expected sale price of cassava roots

I

Recommended rate
of urea in Busega:

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For the cost benefit analysis in Step 4, you need to provide the price you expect to receive for 1 tonne of cassava roots.

3 Obtain the recommended fertilizer rate

We now know how to obtain the recommended fertilizer rates for 1 acre.

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of urea in Busega:
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3 Obtain the recommended fertilizer rate

We now know how to obtain the recommended fertilizer rates for 1 acre.

These need to be converted to the fertilizer amounts required for your field.

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Let's see how this is done in our example for a field of **1.25** acre.

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Let's see how this is done in our example for a field of **1.25** acre.

You simply need to multiply the rates with the area of your field:

Recommended rate
of urea in Busega:
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of DAP in Busega:
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3 Obtain the recommended fertilizer rate

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You simply need to multiply the rates with the area of your field:

$$1.25 \times 40 = 50 \text{ kg of urea}$$



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yield from fertilizer:
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Expected extra
yield from fertilizer:
6 tonne/acre

3 Obtain the recommended fertilizer rate

Let's see how this is done in our example for a field of **1.25** acre.

You simply need to multiply the rates with the area of your field:

$$1.25 \times 40 = 50 \text{ kg of urea}$$

$$1.25 \times 20 = 25 \text{ kg of DAP}$$



Recommended rate
of urea in Busega:
40 kg/acre

Recommended rate
of DAP in Busega:
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Recommended rate
of NPK17:17:17:
80 kg/acre

Expected extra
yield from fertilizer:
6 tonne/acre

3 Obtain the recommended fertilizer rate

Let's see how this is done in our example for a field of **1.25** acre.

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3 Obtain the recommended fertilizer rate

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$$1.25 \times 80 = 100 \text{ kg of NPK17:17:17}$$



Recommended rate
of urea in Busega:
40 kg/acre

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yield from fertilizer:
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3 Obtain the recommended fertilizer rate

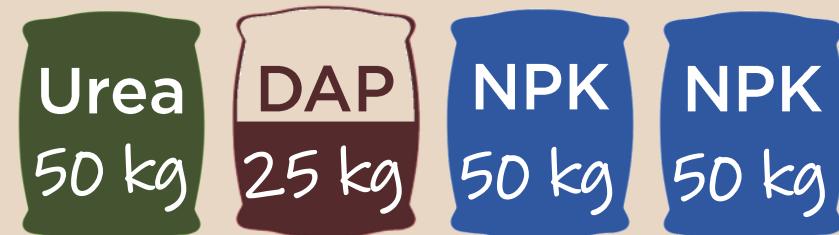
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yield from fertilizer:
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$$1.25 \times 6 = 7.5 \text{ tonnes of roots}$$



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$$1.25 \times 6 = 7.5 \text{ tonnes of roots}$$



But is this profitable?

Let's continue to step 4 and do a cost-benefit analysis...

4 Do a cost-benefit analysis

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Using fertilizer only makes sense if the value gained from the increase in root yield is larger than the cost of fertilizer.

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The recommended fertilizer rates obtained in step **3** are calculated using the common prices of roots and prices of fertilizer in the country.

4 Do a cost-benefit analysis

Using fertilizer only makes sense if the value gained from the increase in root yield is larger than the cost of fertilizer.

The recommended fertilizer rates obtained in step **3** are calculated using the common prices of roots and prices of fertilizer in the country.

You must confirm profitability using the fertilizer prices in your local area, and your expected cassava root price.

4 Do a cost-benefit analysis

Using fertilizer only makes sense if the value gained from the increase in root yield is larger than the cost of fertilizer.

The recommended fertilizer rates obtained in step **3** are calculated using the common prices of roots and prices of fertilizer in the country.

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Remember: under step **2**, we obtained prices of urea, DAP and NPK 17:17:17 from your local agrodealer.

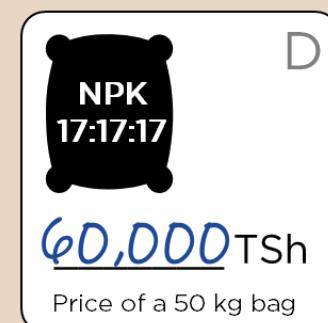
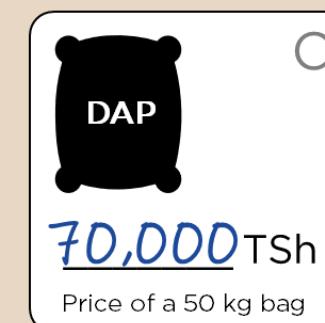
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Using fertilizer only makes sense if the value gained from the increase in root yield is larger than the cost of fertilizer.

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And under step **3**, we recorded the expected sales price of the cassava roots.

4 Do a cost-benefit analysis

Using fertilizer only makes sense if the value gained from the increase in root yield is larger than the cost of fertilizer.

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You must confirm profitability using the fertilizer prices in your local area, and your expected cassava root price.

And under step **3**, we recorded the expected sales price of the cassava roots.

100,000 TSh / tonne |

Expected sale price of cassava roots

4 Do a cost-benefit analysis

You evaluate profitability by comparing

Expected Gross Value Increase

against

Total Cost of Fertilizer

4 Do a cost-benefit analysis

To calculate the

Expected Gross Value Increase

4 Do a cost-benefit analysis

To calculate the

Expected Gross Value Increase

Multiply the root price and the expected extra yield

Price of 1 tonne of
cassava roots (TSh)

×

Expected extra yield
(tonnes/acre)

4 Do a cost-benefit analysis

To calculate the

Total Cost of Fertilizer

4 Do a cost-benefit analysis

To calculate the

Total Cost of Fertilizer

Multiply the price of fertilizer and the rate, then add up

$$+ \frac{\text{Price of 1 bag of urea (TSh)}}{\text{Weight of 1 bag of urea (kg)}} \times \frac{\text{Urea needed for 1 acre (kg)}}$$
$$+ \frac{\text{Price of 1 bag of DAP (TSh)}}{\text{Weight of 1 bag of DAP (kg)}} \times \frac{\text{DAP needed for 1 acre (kg)}}$$
$$+ \frac{\text{Price of 1 bag of NPK (TSh)}}{\text{Weight of 1 bag of NPK (kg)}} \times \frac{\text{NPK needed for 1 acre (kg)}}$$

Urea needed
for 1 acre (kg)

DAP needed
for 1 acre (kg)

NPK needed
for 1 acre (kg)

4 Do a cost-benefit analysis

The worksheet helps you do these calculations:

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
|---------------------------|------------|--------|---|
| Increase in production | A x H | tonnes | J |
| Increase in gross revenue | H x I | TSh | K |
| Quantity of urea to apply | A x E | kg | L |
| Quantity of DAP to apply | A x F | kg | M |
| Quantity of NPK to apply | A x G | kg | N |
| Cost of urea | L x B ÷ 50 | TSh | O |
| Cost of DAP | M x C ÷ 50 | TSh | P |
| Cost of NPK | N x D ÷ 50 | TSh | Q |
| Total cost | O + P + Q | TSh | R |
| Profit from fertilizer | K - R | TSh | S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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1.25 A
acre

Your field area

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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1.25 A
acre

Your field area

6 H
tonnes / acre

Expected yield response

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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1.25 A
acre

Your field area

6 H
tonnes / acre

Expected yield response

$$1.25 \times 6 = 7.5$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | |
|---------------------------|------------|--------------|
| Increase in production | A x H | 7.5 tonnes J |
| Increase in gross revenue | H x I | TSh K |
| Quantity of urea to apply | A x E | kg L |
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1.25 A acre
Your field area

6 tonnes / acre
Expected yield response

$$1.25 \times 6 = 7.5$$

4 Do a cost-benefit analysis

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| Profit from fertilizer | $K - R$ | TSh S |
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4 Do a cost-benefit analysis

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| Cost of NPK | $N \times D \div 50$ | TSh Q |
| Total cost | $O + P + Q$ | TSh R |
| Profit from fertilizer | $K - R$ | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | T |

4 Do a cost-benefit analysis

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Now do the following calculations:

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| Profit from fertilizer | $K - R$ | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | T |

100,000 TSh / tonne

Expected sale price of cassava roots

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | |
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| Increase in production | A x H | 7.5 tonnes J |
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| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |

100,000 TSh / tonne

Expected sale price of cassava roots

$$7.5 \times 100,000 = 750,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | |
|---------------------------|------------|---------------|
| Increase in production | A x H | 7.5 tonnes J |
| Increase in gross revenue | H x I | 750,000 TSh K |
| Quantity of urea to apply | A x E | kg L |
| Quantity of DAP to apply | A x F | kg M |
| Quantity of NPK to apply | A x G | kg N |
| Cost of urea | L x B ÷ 50 | TSh O |
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| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |

100,000 TSh / tonne

Expected sale price of cassava roots

$$7.5 \times 100,000 = 750,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
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4 Do a cost-benefit analysis

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1.25 A
acre

Your field area

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
|---------------------------|------------|------------|-------|
| Increase in production | A x H | 7.5 tonnes | J |
| Increase in gross revenue | H x I | 750,000 | TSh K |
| Quantity of urea to apply | A x E | kg | L |
| Quantity of DAP to apply | A x F | kg | M |
| Quantity of NPK to apply | A x G | kg | N |
| Cost of urea | L x B ÷ 50 | TSh | O |
| Cost of DAP | M x C ÷ 50 | TSh | P |
| Cost of NPK | N x D ÷ 50 | TSh | Q |
| Total cost | O + P + Q | TSh | R |
| Profit from fertilizer | K - R | TSh | S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
acre

Your field area

40 E
kg / acre

Recommended urea rate

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Increase in production | A x H | 7.5 tonnes | J |
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| Total cost | O + P + Q | TSh | R |
| Profit from fertilizer | K - R | TSh | S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
Your field area

40 E
Recommended urea rate

$$1.25 \times 40 = 50$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Quantity of urea to apply | A x E | 50 | kg L |
| Quantity of DAP to apply | A x F | | kg M |
| Quantity of NPK to apply | A x G | | kg N |
| Cost of urea | L x B ÷ 50 | | TSh O |
| Cost of DAP | M x C ÷ 50 | | TSh P |
| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
Your field area

40 E
Recommended urea rate

$$1.25 \times 40 = 50$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
|---------------------------|------------|------------|-------|
| Increase in production | A x H | 7.5 tonnes | J |
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| Cost of urea | L x B ÷ 50 | | TSh O |
| Cost of DAP | M x C ÷ 50 | | TSh P |
| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Increase in production | A x H | 7.5 tonnes | J |
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| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

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| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
acre

Your field area

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Increase in production | A x H | 7.5 tonnes | J |
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| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
acre

Your field area

20 F
kg / acre

Recommended DAP rate

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Increase in production | A x H | 7.5 tonnes | J |
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| Cost of DAP | M x C ÷ 50 | | TSh P |
| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
Your field area

20 F
Recommended DAP rate

$$1.25 \times 20 = 25$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Increase in production | A x H | 7.5 tonnes | J |
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| Quantity of urea to apply | A x E | 50 | kg L |
| Quantity of DAP to apply | A x F | 25 | kg M |
| Quantity of NPK to apply | A x G | | kg N |
| Cost of urea | L x B ÷ 50 | | TSh O |
| Cost of DAP | M x C ÷ 50 | | TSh P |
| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
Your field area

20 F
Recommended DAP rate

$$1.25 \times 20 = 25$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Total cost | O + P + Q | | TSh R |
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4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

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| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

1.25 A
acre

Your field area

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |

1.25 A
Your field area

80 G
Recommended NPK rate

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |

1.25 A
Your field area

80 G
Recommended NPK rate

$$1.25 \times 80 = 100$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | |
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| Cost of DAP | M x C ÷ 50 | TSh P |
| Cost of NPK | N x D ÷ 50 | TSh Q |
| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |

1.25 A
Your field area

80 G
Recommended NPK rate

$$1.25 \times 80 = 100$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Cost of DAP | M x C ÷ 50 | TSh P |
| Cost of NPK | N x D ÷ 50 | TSh Q |
| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
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4 Do a cost-benefit analysis

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| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
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4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

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| Total cost | $O + P + Q$ | | TSh R |
| Profit from fertilizer | $K - R$ | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

4 Do a cost-benefit analysis

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| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |



$$50 \times 50,000 \div 50 = 50,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Total cost | $O + P + Q$ | TSh R |
| Profit from fertilizer | $K - R$ | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | T |



$$50 \times 50,000 \div 50 = 50,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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4 Do a cost-benefit analysis

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| Cost of NPK | N x D ÷ 50 | | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

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| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

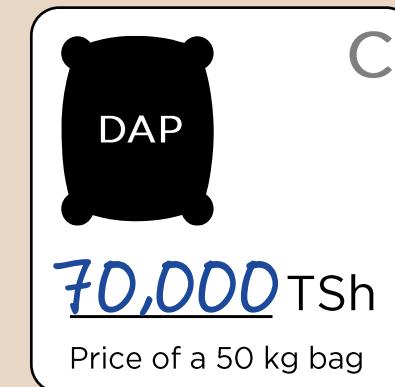
| | | | |
|---------------------------|----------------------|------------|-------|
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| Quantity of urea to apply | $A \times E$ | 50 kg | I |
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| Cost of urea | $L \times B \div 50$ | 50,000 | TSh O |
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| Total cost | $O + P + Q$ | | TSh R |
| Profit from fertilizer | $K - R$ | | TSh S |
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4 Do a cost-benefit analysis

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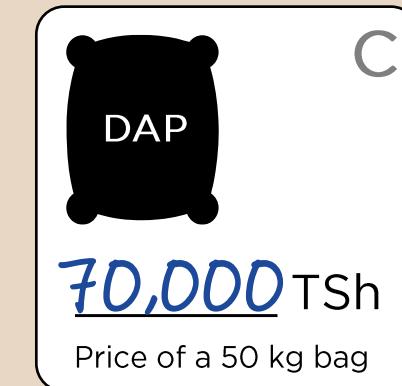


4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | T |



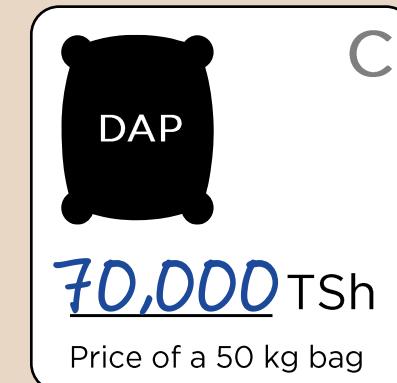
$$25 \times 70,000 \div 50 = 35,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | |
|---------------------------|------------|---------------|
| Increase in production | A x H | 7.5 tonnes J |
| Increase in gross revenue | H x I | 750,000 TSh K |
| Quantity of urea to apply | A x E | 50 kg L |
| Quantity of DAP to apply | A x F | 25 kg M |
| Quantity of NPK to apply | A x G | 100 kg N |
| Cost of urea | L x B ÷ 50 | 50,000 TSh O |
| Cost of DAP | M x C ÷ 50 | 35,000 TSh P |
| Cost of NPK | N x D ÷ 50 | TSh Q |
| Total cost | O + P + Q | TSh R |
| Profit from fertilizer | K - R | TSh S |
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$$25 \times 70,000 \div 50 = 35,000$$

4 Do a cost-benefit analysis

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| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

4 Do a cost-benefit analysis

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4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

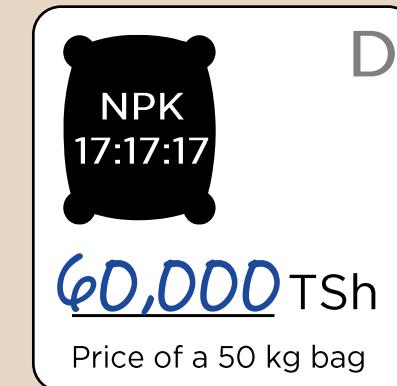
| | | |
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| Increase in production | $A \times H$ | 7.5 tonnes J |
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| Cost of NPK | $N \times D \div 50$ | TSh Q |
| Total cost | $O + P + Q$ | TSh R |
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4 Do a cost-benefit analysis

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| Total cost | $O + P + Q$ | TSh R |
| Profit from fertilizer | $K - R$ | TSh S |
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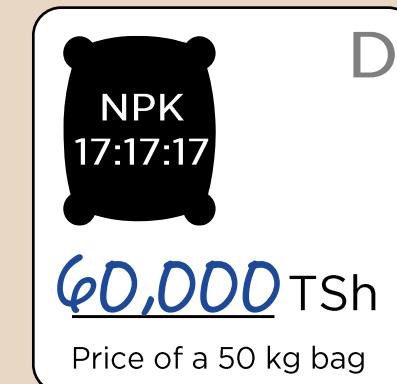


4 Do a cost-benefit analysis

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| Total cost | $O + P + Q$ | TSh R |
| Profit from fertilizer | $K - R$ | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | T |



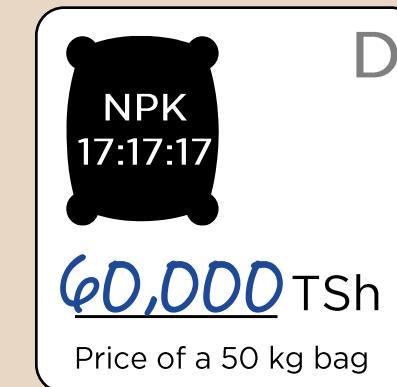
$$100 \times 60,000 \div 50 = 120,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Cost of NPK | $N \times D \div 50$ | 120,000 TSh Q |
| Total cost | $O + P + Q$ | TSh R |
| Profit from fertilizer | $K - R$ | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | T |



$$100 \times 60,000 \div 50 = 120,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

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4 Do a cost-benefit analysis

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| Quantity of NPK to apply | $A \times G$ | 100 | kg N |
| Cost of urea | $L \times B \div 50$ | 50,000 | TSh O |
| Cost of DAP | $M \times C \div 50$ | 35,000 | TSh P |
| Cost of NPK | $N \times D \div 50$ | 120,000 | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

4 Do a cost-benefit analysis

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Now do the following calculations:

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| Quantity of NPK to apply | $A \times G$ | 100 | kg N |
| Cost of urea | $L \times B \div 50$ | 50,000 | TSh O |
| Cost of DAP | $M \times C \div 50$ | 55,000 | TSh P |
| Cost of NPK | $N \times D \div 50$ | 120,000 | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
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4 Do a cost-benefit analysis

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| Cost of urea | $L \times B \div 50$ | 50,000 | TSh O |
| Cost of DAP | $M \times C \div 50$ | 35,000 | TSh P |
| Cost of NPK | $N \times D \div 50$ | 120,000 | TSh Q |
| Total cost | O + P + Q | | TSh R |
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| Benefit cost ratio (BCR) | $K \div R$ | | T |

50,000

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Cost of urea | $L \times B \div 50$ | 50,000 | TSh O |
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| Cost of NPK | $N \times D \div 50$ | 120,000 | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

50,000

4 Do a cost-benefit analysis

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| Cost of NPK | N x D ÷ 50 | 120,000 | TSh Q |
| Total cost | O + P + Q | | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

50,000
35,000

4 Do a cost-benefit analysis

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50,000
35,000

4 Do a cost-benefit analysis

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4 Do a cost-benefit analysis

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$$\begin{array}{r} 50,000 \\ 35,000 \\ + 120,000 \\ \hline 205,000 \end{array}$$

4 Do a cost-benefit analysis

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| Total cost | O + P + Q | 205,000 | TSh R |
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4 Do a cost-benefit analysis

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| Total cost | $O + P + Q$ | 205,000 | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

4 Do a cost-benefit analysis

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| Total cost | O + P + Q | 205,000 | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

750,000

4 Do a cost-benefit analysis

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| Cost of NPK | $N \times D \div 50$ | 120,000 | TSh Q |
| Total cost | O + P + Q | 205,000 | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | | T |

750,000

4 Do a cost-benefit analysis

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| Cost of DAP | M x C ÷ 50 | 35,000 | TSh P |
| Cost of NPK | N x D ÷ 50 | 120,000 | TSh Q |
| Total cost | O + P + Q | 205,000 | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

$$750,000 - 205,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

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| Cost of DAP | M x C ÷ 50 | 35,000 | TSh P |
| Cost of NPK | N x D ÷ 50 | 120,000 | TSh Q |
| Total cost | O + P + Q | 205,000 | TSh R |
| Profit from fertilizer | K - R | | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

$$750,000 - 205,000 = 545,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
|---------------------------|------------|------------|-------|
| Increase in production | A x H | 7.5 tonnes | J |
| Increase in gross revenue | H x I | 750,000 | TSh K |
| Quantity of urea to apply | A x E | 50 | kg L |
| Quantity of DAP to apply | A x F | 25 | kg M |
| Quantity of NPK to apply | A x G | 100 | kg N |
| Cost of urea | L x B ÷ 50 | 50,000 | TSh O |
| Cost of DAP | M x C ÷ 50 | 35,000 | TSh P |
| Cost of NPK | N x D ÷ 50 | 120,000 | TSh Q |
| Total cost | O + P + Q | 205,000 | TSh R |
| Profit from fertilizer | K - R | 545,000 | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | | T |

$$750,000 - 205,000 = 545,000$$

4 Do a cost-benefit analysis

4 Do a cost benefit analysis

Now do the following calculations:

| | | | |
|---------------------------|----------------------|------------|-------|
| Increase in production | $A \times H$ | 7.5 tonnes | J |
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| Quantity of DAP to apply | $A \times F$ | 25 | kg M |
| Quantity of NPK to apply | $A \times G$ | 100 | kg N |
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$$750,000 \div 205,000$$

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$$750,000 \div 205,000 = 3.7$$

4 Do a cost-benefit analysis

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| Profit from fertilizer | K - R | 545,000 | TSh S |
| Benefit cost ratio (BCR) | K ÷ R | 3.7 | T |

$$750,000 \div 205,000 = 3.7$$

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| Total cost | $O + P + Q$ | 205,000 | TSh R |
| Profit from fertilizer | $K - R$ | 545,000 | TSh S |
| Benefit cost ratio (BCR) | $K \div R$ | 3.7 | T |

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- 1 What is the increase in gross revenue?

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- 1 What is the increase in gross revenue?

We expect to produce an additional 7.5 tonnes of cassava roots in our field. This has value of 750,000 TSh.

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- 1 What is the increase in gross revenue? 750,000 TSh

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- 1 What is the increase in gross revenue? 750,000 TSh
- 2 What is the total cost of fertilizer?

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- 1 What is the increase in gross revenue? **750,000 TSh**
- 2 What is the total cost of fertilizer?
We calculated that our field needs 50 kg of urea, 25 kg of DAP and 100 kg of NPK 17:17:17. This has a cost of $50,000 + 35,000 + 120,000 = 205,000$ TSh.

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- | | | |
|---|--|-------------|
| 1 | What is the increase in gross revenue? | 750,000 TSh |
| 2 | What is the total cost of fertilizer? | 205,000 TSh |

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Let's evaluate: is fertilizer use profitable?

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| 1 | What is the increase in gross revenue? | 750,000 TSh |
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Whether this profit is large enough depends on your risk appetite.

4 Do a cost-benefit analysis

Let's look at your risk appetite. How often do you invest in new farm products or technologies?

4 Do a cost-benefit analysis

Let's look at your risk appetite. How often do you invest in new farm products or technologies?

Farmers who invest often in new products or technologies like taking risks, and can usually also afford to make investments that do not pay off.

The lower your risk appetite, the larger the expected profit margin must therefore be, to justify an investment in fertilizer.

4 Do a cost-benefit analysis

Let's look at your risk appetite. How often do you invest in new farm products or technologies?

Very rarely

Sometimes

Often

4 Do a cost-benefit analysis

Let's look at your risk appetite. How often do you invest in new farm products or technologies?

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You don't like taking risks

4 Do a cost-benefit analysis

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Only invest in fertilizer if
Expected Gross Value Increase
is at least 3 times larger than
Total Cost of Fertilizer

4 Do a cost-benefit analysis

Let's look at your risk appetite. How often do you invest in new farm products or technologies?

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Only invest in fertilizer if
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Only invest in fertilizer if
Expected Gross Value Increase
is at least 20% larger than
Total Cost of Fertilizer

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

- | | | |
|---|--|---------------|
| 1 | What is the increase in gross revenue? | 750,000 TSh |
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Whether this profit is large enough depends on your risk appetite.

$$3 \times \text{cost} = 3 \times 205,000 = 615,000$$

$615,000 < 750,000 \rightarrow$ Fertilizer is recommended!
(even if you are very risk-averse)

4 Do a cost-benefit analysis

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- | | | |
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The farmer's worksheet guides you through these steps.

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The ratio of benefits over costs (BCR) was already calculated:

4 Do a cost-benefit analysis

Let's evaluate: is fertilizer use profitable?

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| Benefit cost ratio (BCR) | $K \div R$ | T |
|--------------------------|------------|---|

4 Do a cost-benefit analysis

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- 1 What is the increase in gross revenue? 750,000 TSh
- 2 What is the total cost of fertilizer? $\underline{- \quad 205,000 \text{ TSh}}$
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The ratio of benefits over costs (BCR) was already calculated:

| | | | |
|--------------------------|------------|-----|---|
| Benefit cost ratio (BCR) | $K \div R$ | 3.6 | T |
|--------------------------|------------|-----|---|

$$750,000 \div 205,000 = 3.6$$

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| Benefit cost ratio (BCR) | $K \div R$ | 3.6 | T |
|--------------------------|------------|-----|---|

How often do you invest in new farm products or technologies?

- Rarely You don't like taking risks. Invest in fertilizer if $BCR(T) > 2.8$
- Sometimes You can accept some risk. Invest in fertilizer if $BCR(T) > 2$
- Often You like taking risks. Invest in fertilizer if $BCR(T) > 1.2$

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How often do you invest in new farm products or technologies?

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You don't like taking risks.

Invest in fertilizer if $BCR(T) > 2.8$

- Sometimes

You can accept some risk.

Invest in fertilizer if $BCR(T) > 2$

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You like taking risks.

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3.6 > 2.8!

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3.6 > 2.8!

5 Apply fertilizer at the right time

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- Fertilizer must always be applied when the soil is moist, after 1 or 2 rain showers.

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- Fertilizer must always be applied when the soil is moist, after 1 or 2 rain showers.
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- Apply NPK next in 1 or 2 splits, depending on the quantity to apply and the rainfall pattern in your area. Apply the first split of NPK around 1 month after planting.

5 Apply fertilizer at the right time

- Fertilizer must always be applied when the soil is moist, after 1 or 2 rain showers.
- Apply the full dose of DAP first, at planting.
- Apply NPK next in 1 or 2 splits, depending on the quantity to apply and the rainfall pattern in your area. Apply the first split of NPK around 1 month after planting.
- Apply urea last, again in 1 or 2 splits, depending again on the quantity to apply and the rainfall pattern. Spread the application between the 2nd and 4th month after planting.

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This is also explained in the farmer's worksheet:

5 Apply fertilizer at the right time

Apply DAP at planting, follow with NPK, and apply urea last.
Spread applications during the first 3-4 months as rains permit.

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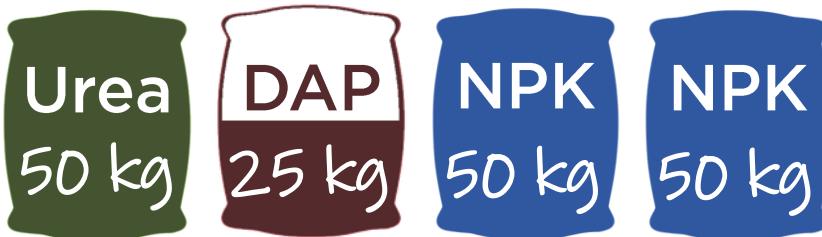
Let's look at our example for our field of **1.25** acre.

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Remember: we had previously calculated the amounts of urea, DAP and NPK 17:17:17 to apply.

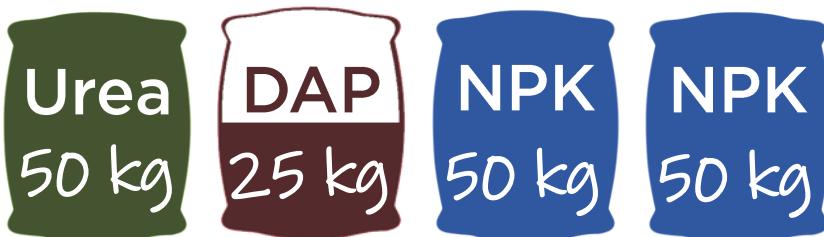


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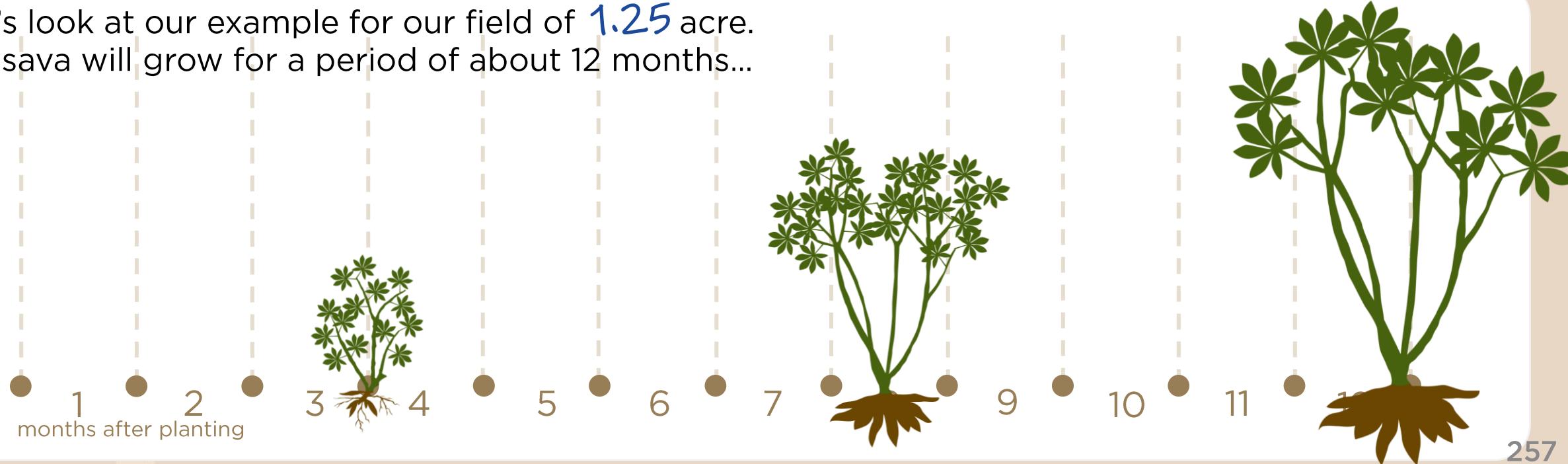
When is this fertilizer now best applied?



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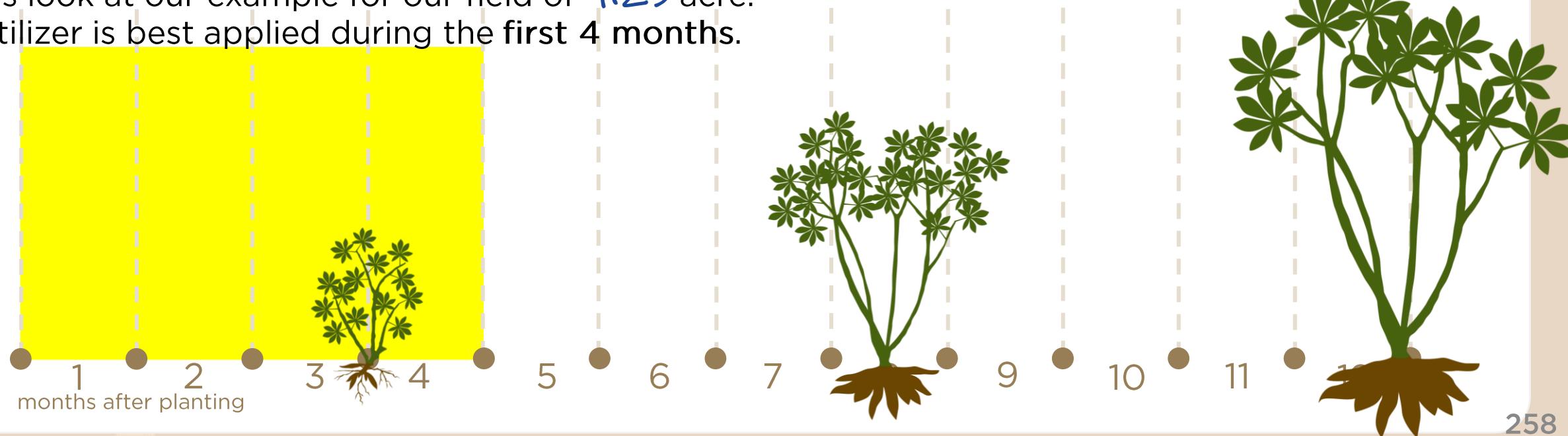
Let's look at our example for our field of **1.25** acre.
Cassava will grow for a period of about 12 months...



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Let's look at our example for our field of **1.25** acre.
Fertilizer is best applied during the first 4 months.

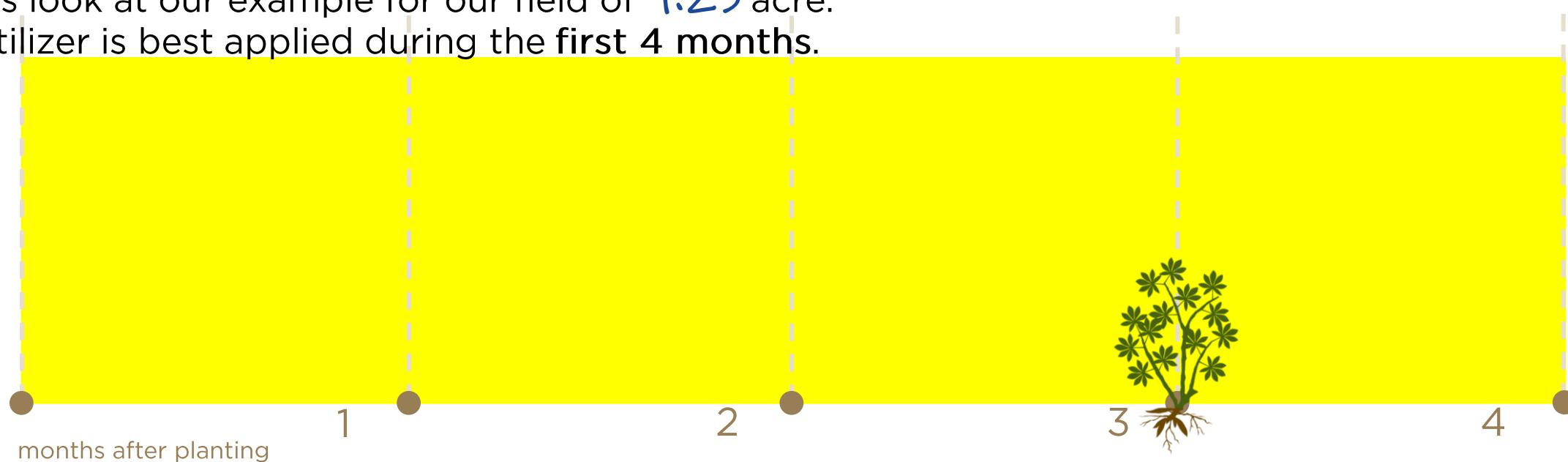


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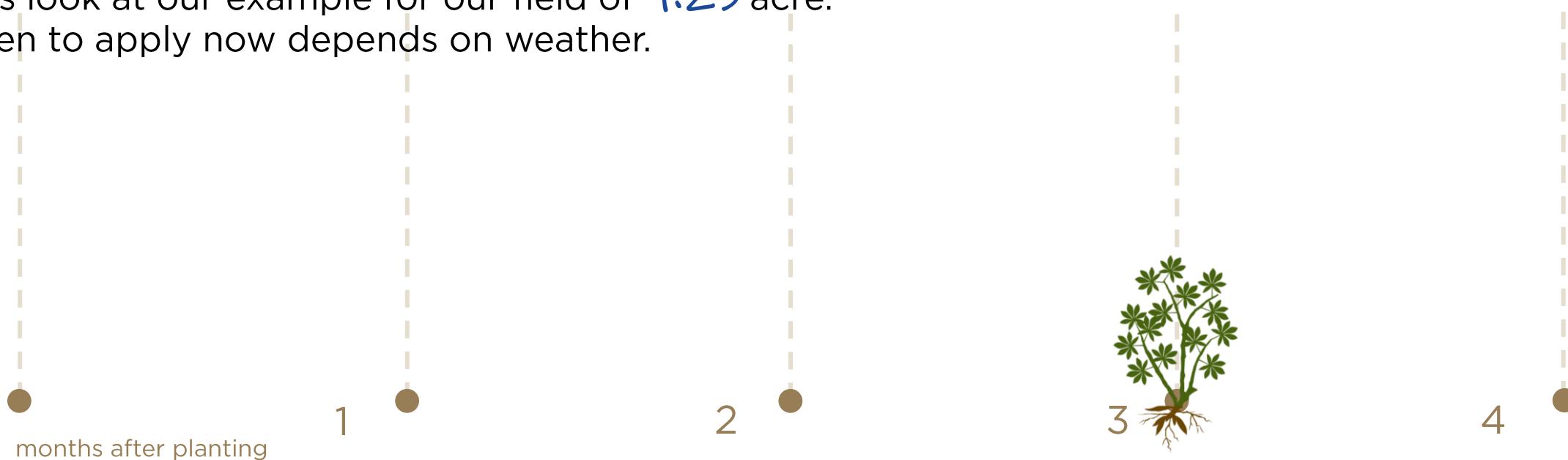


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Let's look at our example for our field of **1.25** acre.

When to apply now depends on weather.

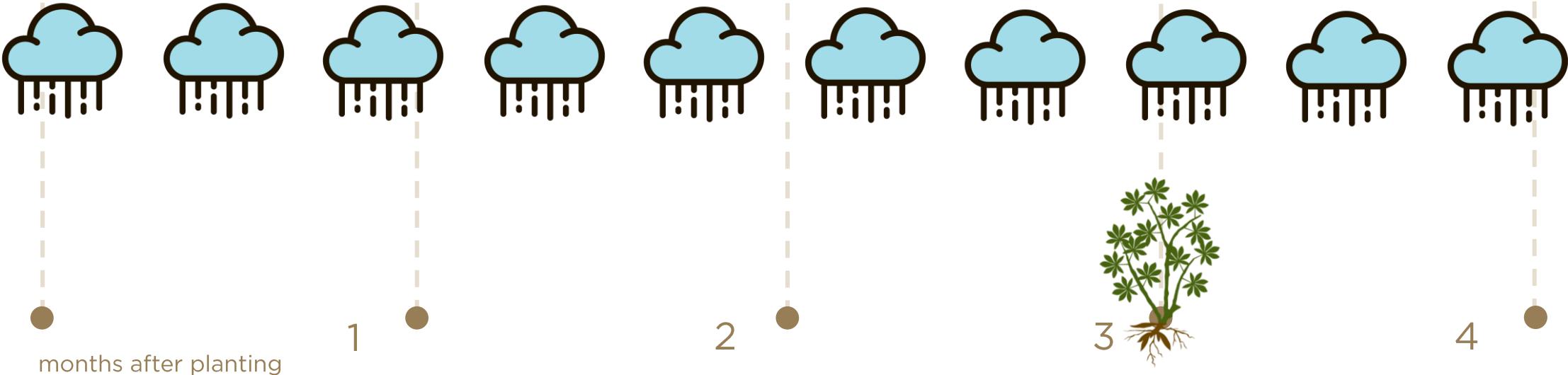


5 Apply fertilizer at the right time

- Fertilizer must always be applied when the soil is moist, after 1 or 2 rain showers.
- Apply the full dose of DAP first, at planting.
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- Apply urea last, again in 1 or 2 splits, depending again on the quantity to apply and the rainfall pattern. Spread the application between the 2nd and 4th month after planting.

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If you expect ample and regular rainfall...

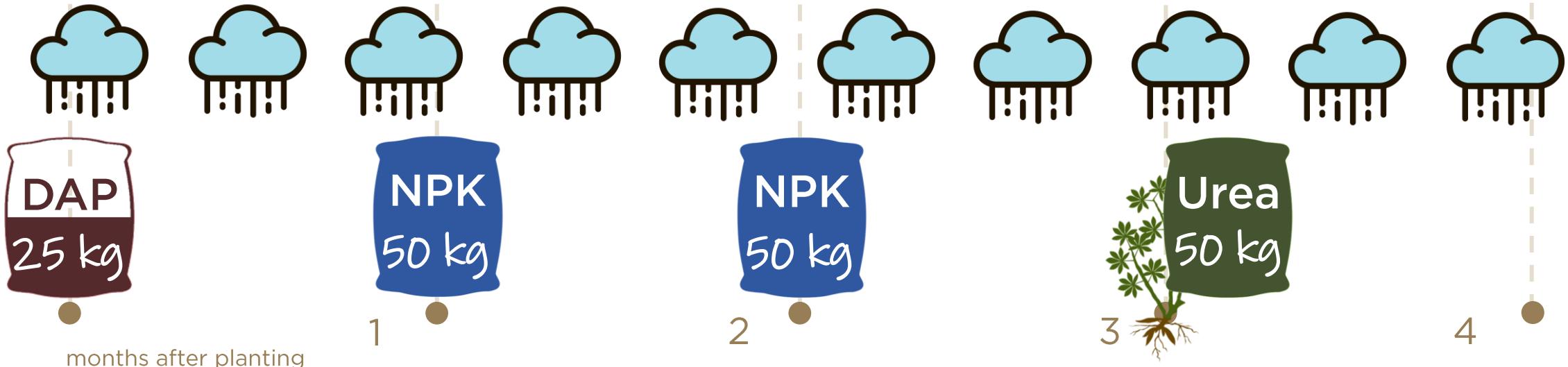


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If you expect ample and regular rainfall... then split and spread the fertilizer application.

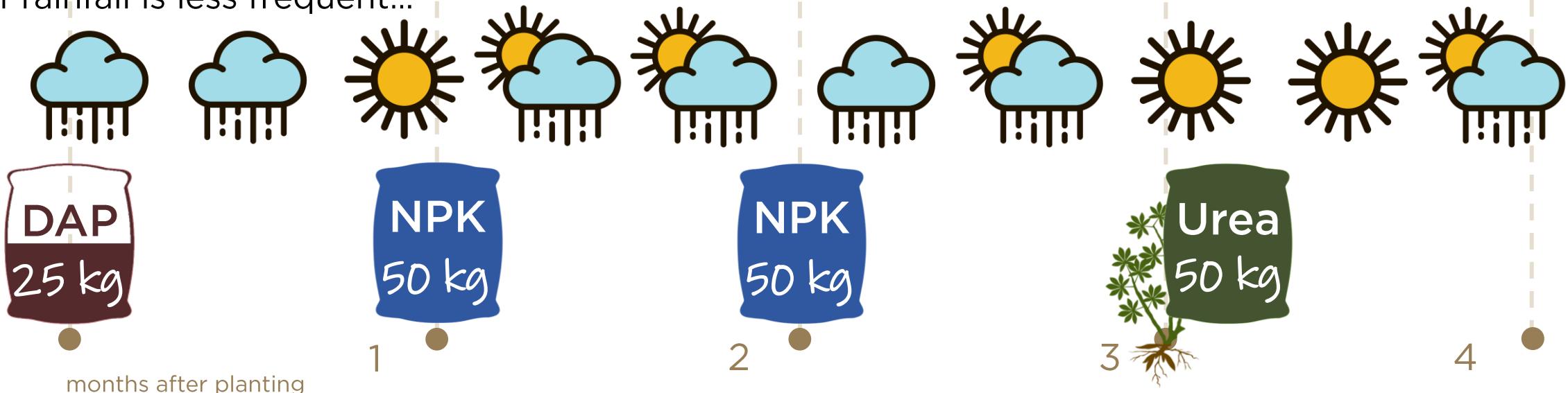


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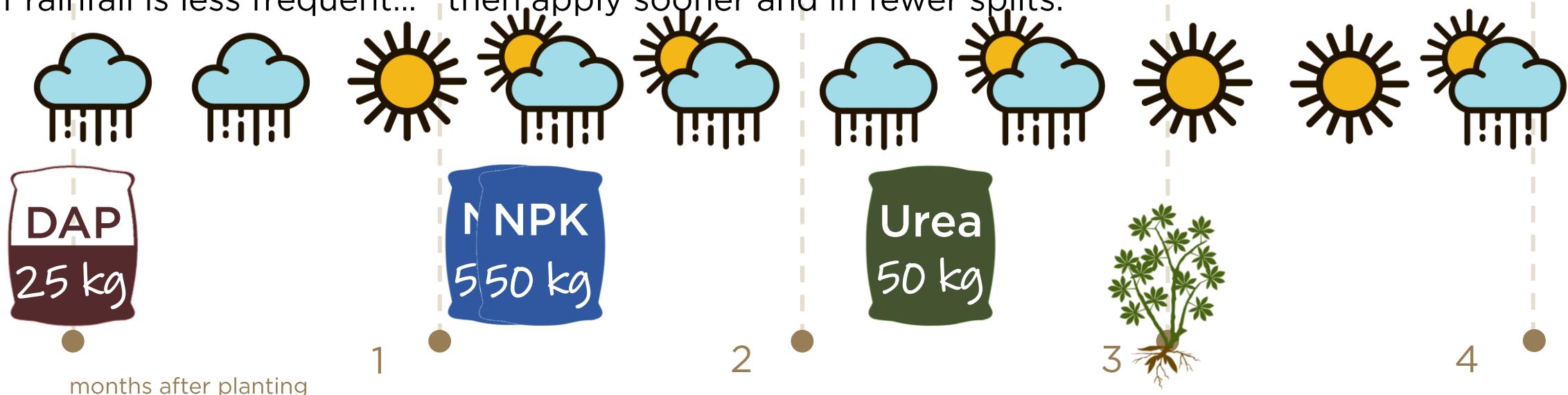


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If rainfall is less frequent... then apply sooner and in fewer splits.

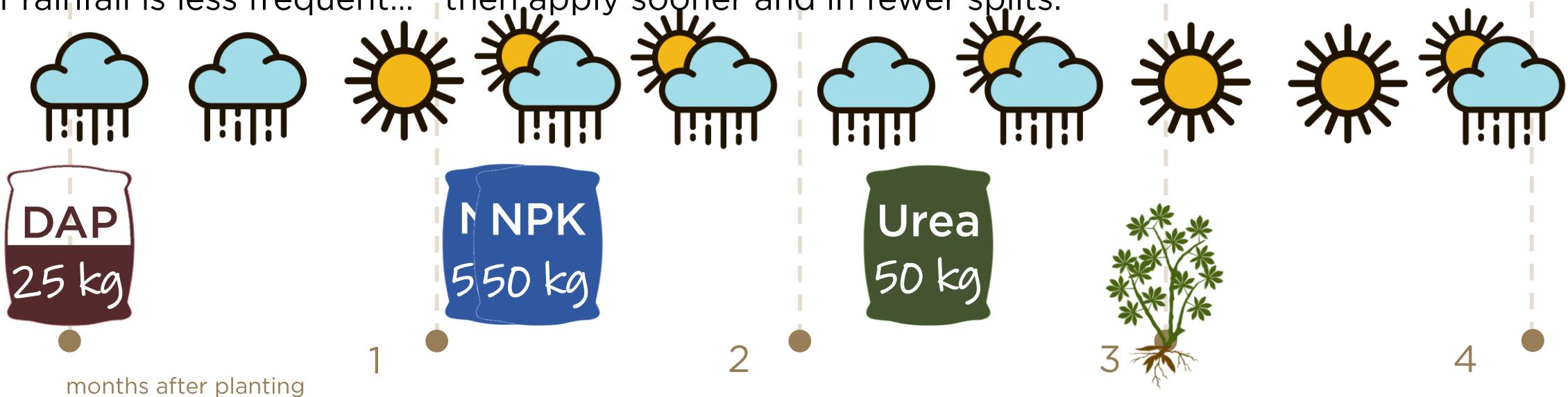


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These are examples!

You can modify this, but remember to apply DAP first, then follow with NPK 17:17:17, and urea last. Spread applications of NPK and urea as much as possible. Only apply fertilizer if the soil is moist and you expect continued rainfall in the weeks after application.

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Especially with high fertilizer doses, it is important to split and spread application. That way, nutrients will be less easily washed away by rain, and then nutrients in the fertilizer are available when the cassava crop needs them.

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Apply in a half-moon or full ring furrow around each plant and cover with soil. Only apply fertilizer if the soil is moist.

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1 bag (of 50 kg) per acre is about 2 full water caps per plant



If you plant at 1 m between rows and 1 m within row (4,000 plants per acre), then 1 bag of fertilizer per acre is about 2 full water caps of fertilizer per plant.

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40 kg per acre
is about 2 levelled
water caps per plant



And if the fertilizer is levelled instead of heaped, than two water caps per plant corresponds to about 40 kg per acre.

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Let's look at our example for our field of **1.25** acre.

We had obtained the recommended rates for Busega, Simiyu region, when planting in November.

Recommended rate
of urea in Busega:
40 kg/acre

Recommended rate
of DAP in Busega:
20 kg/acre

Recommended rate
of NPK17:17:17:
80 kg/acre

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So let's now see how much this is per plant...

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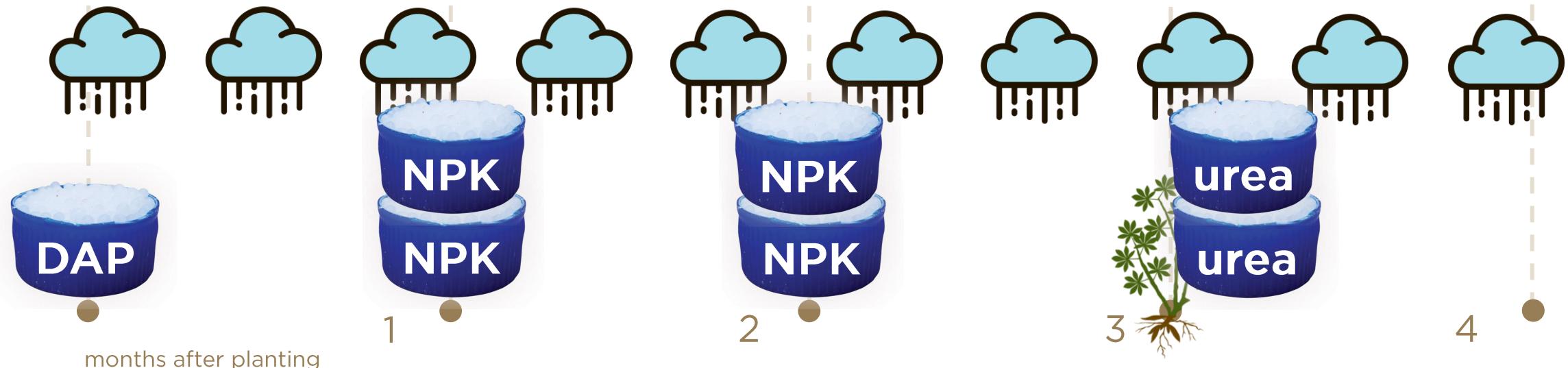
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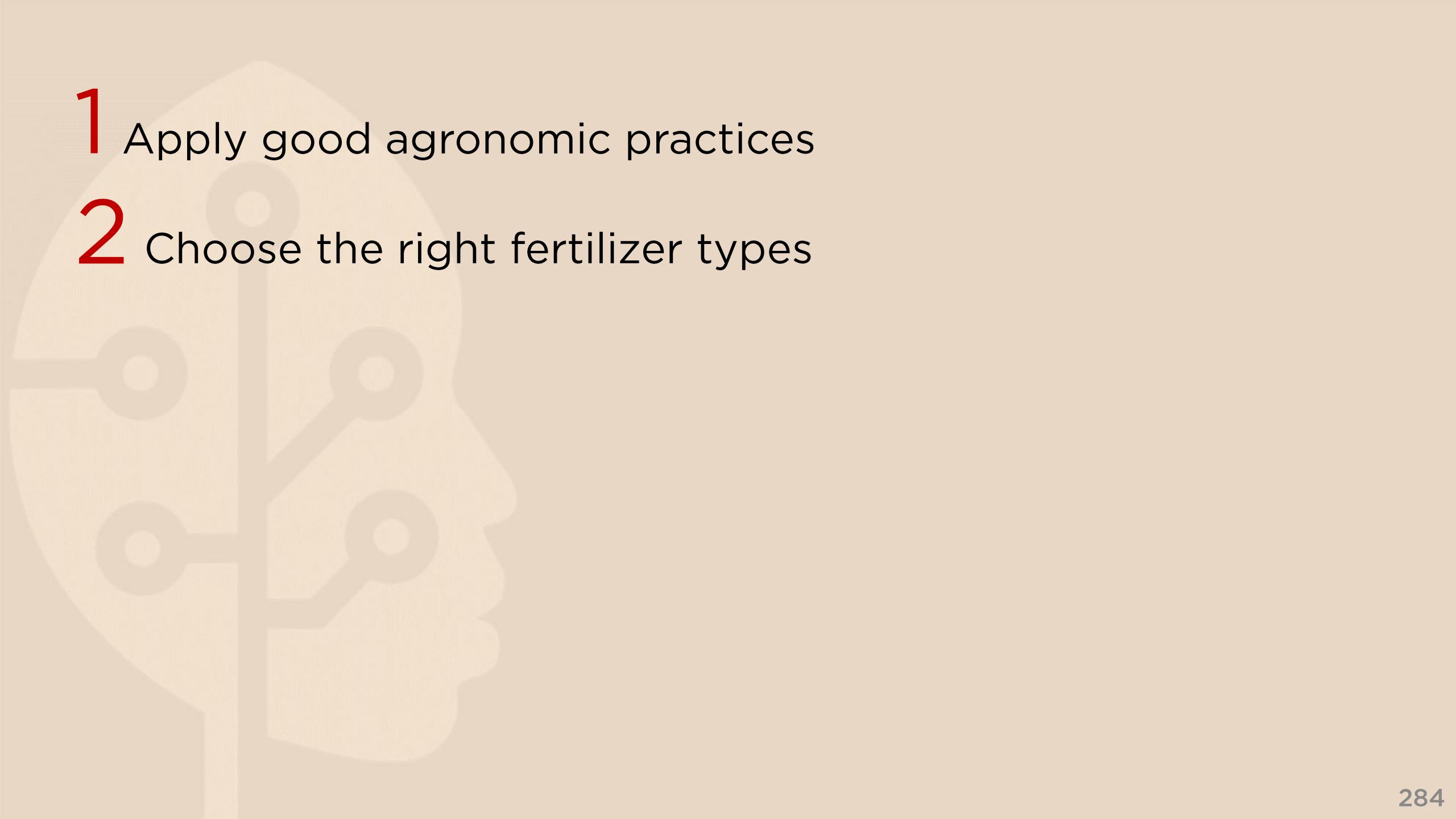


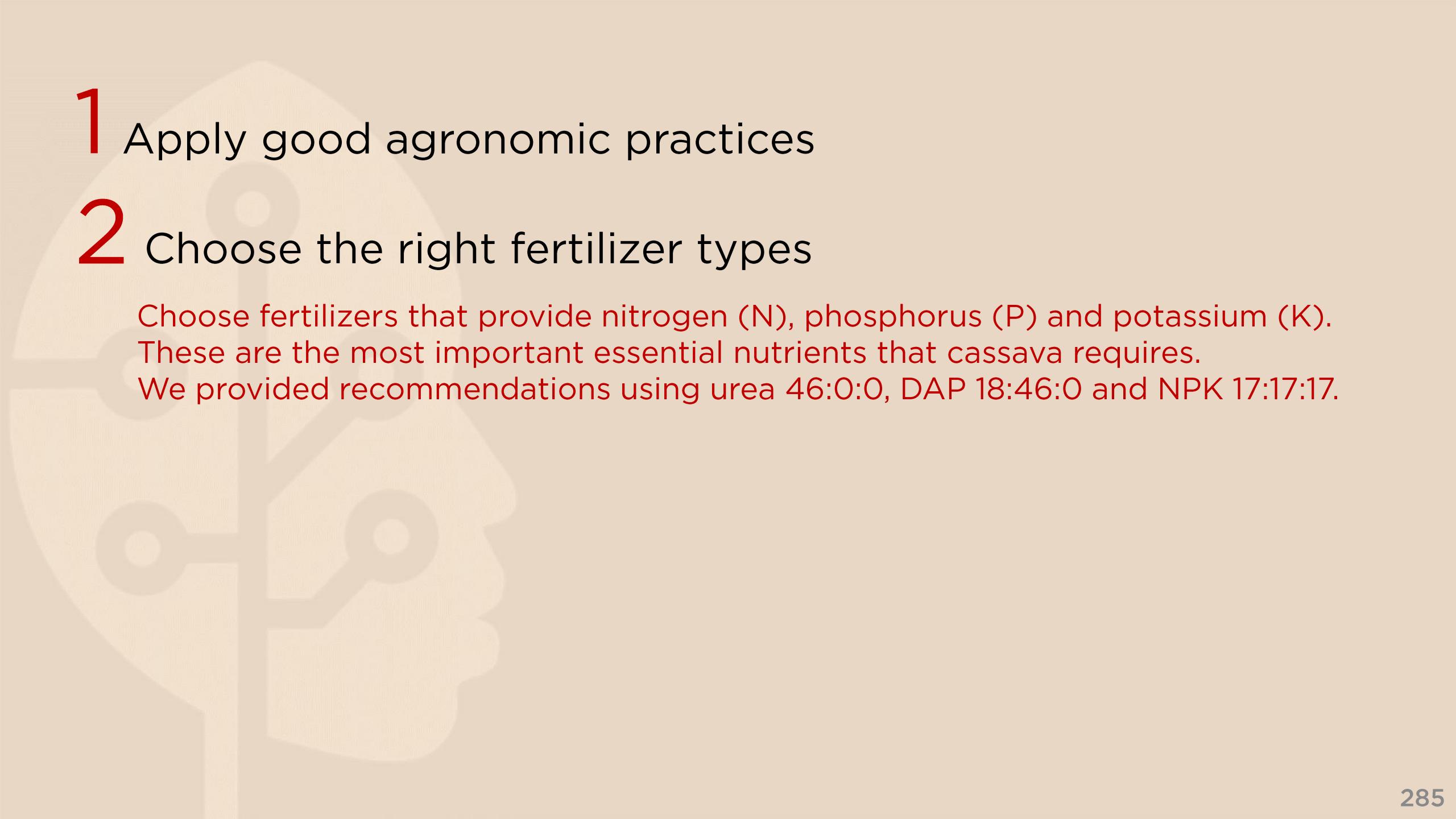
So what have we learned?

1 Apply good agronomic practices

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Fertilizer use is only sensible if good agronomic practices are upheld! Practice good land preparation and weed control, plant disease-free cuttings of improved varieties, and plant in lines at the right density.

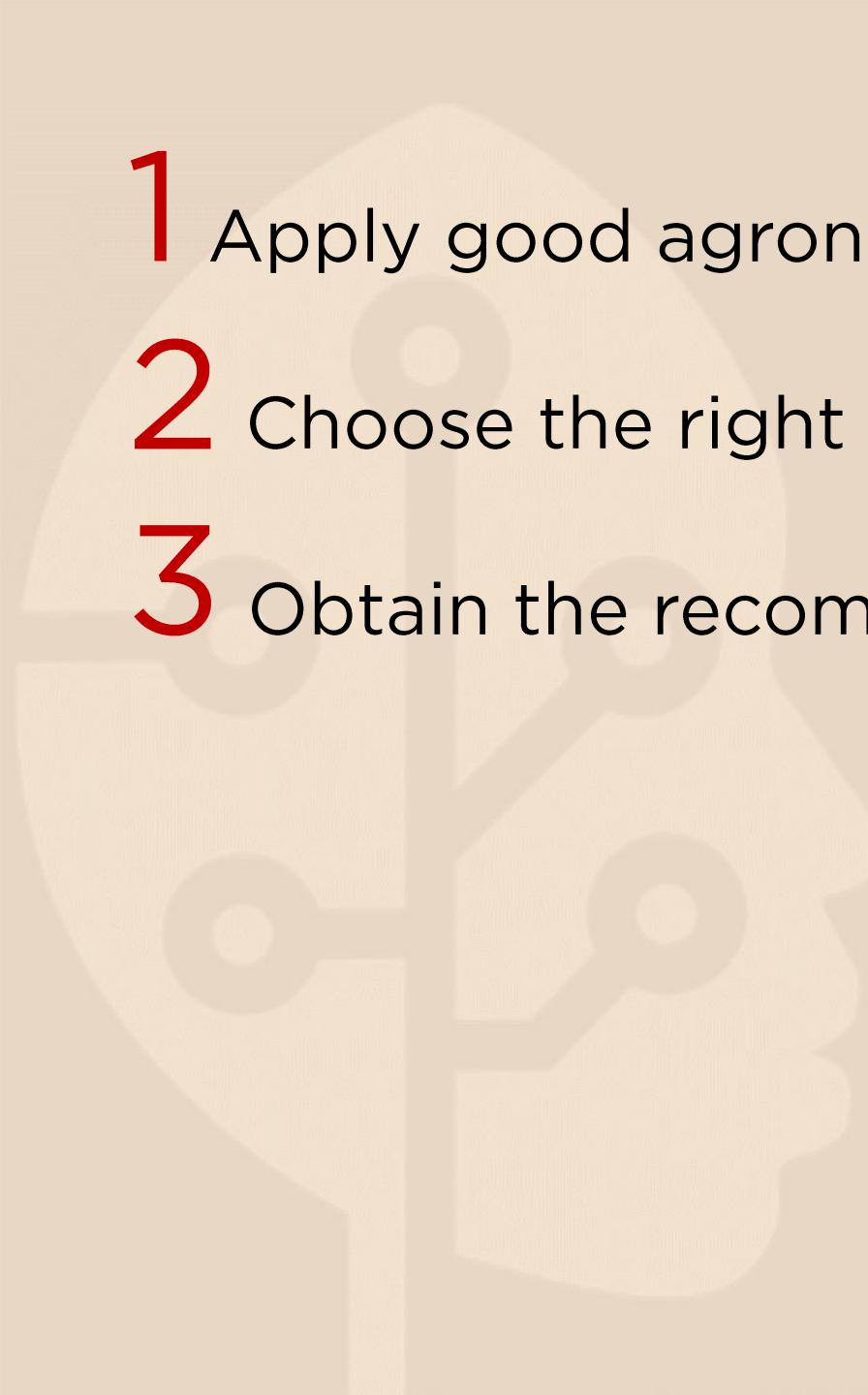
- 
- 1 Apply good agronomic practices
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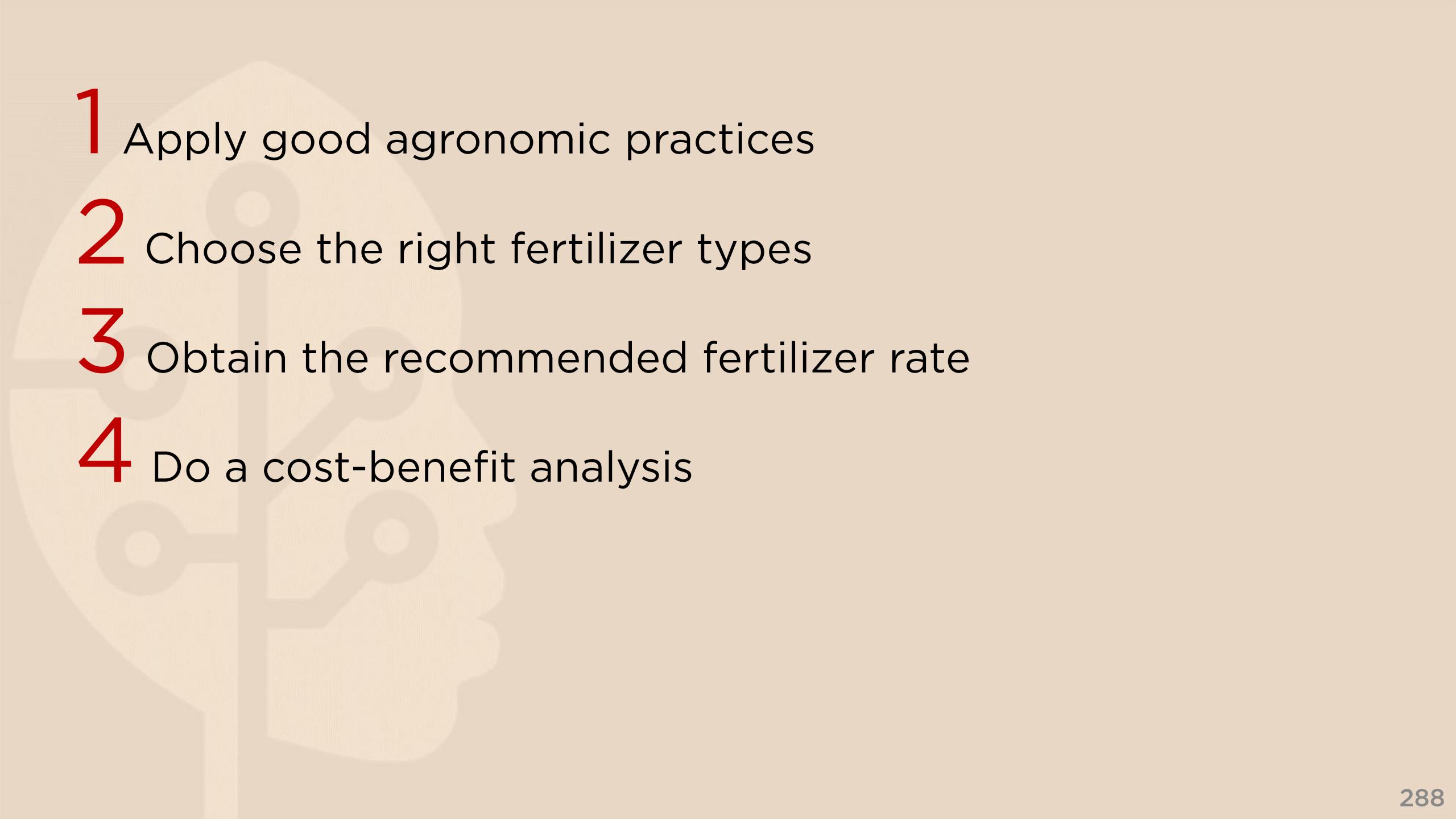
2 Choose the right fertilizer types

Choose fertilizers that provide nitrogen (N), phosphorus (P) and potassium (K). These are the most important essential nutrients that cassava requires. We provided recommendations using urea 46:0:0, DAP 18:46:0 and NPK 17:17:17.

- 
- 1** Apply good agronomic practices
 - 2** Choose the right fertilizer types
 - 3** Obtain the recommended fertilizer rate

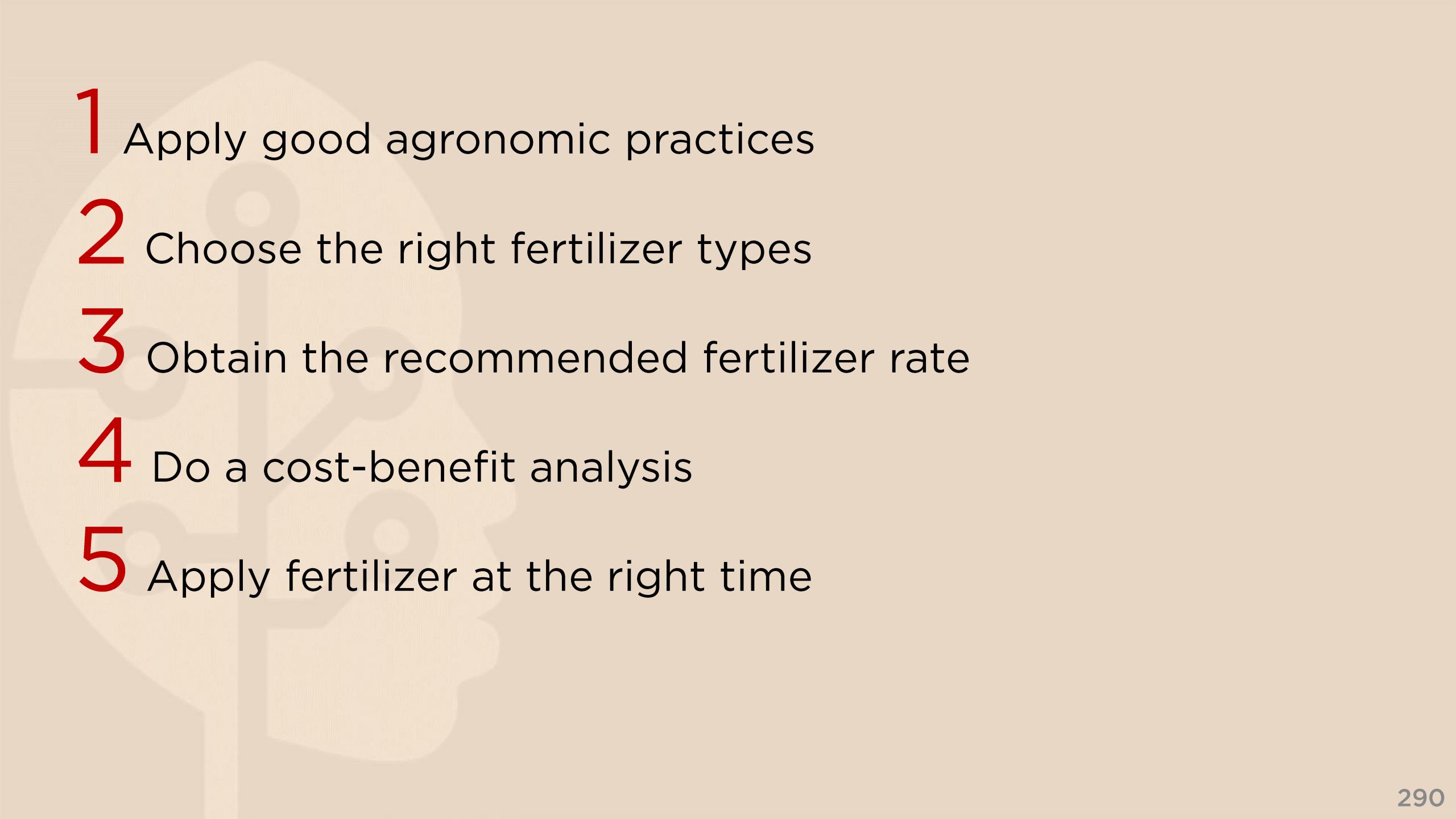
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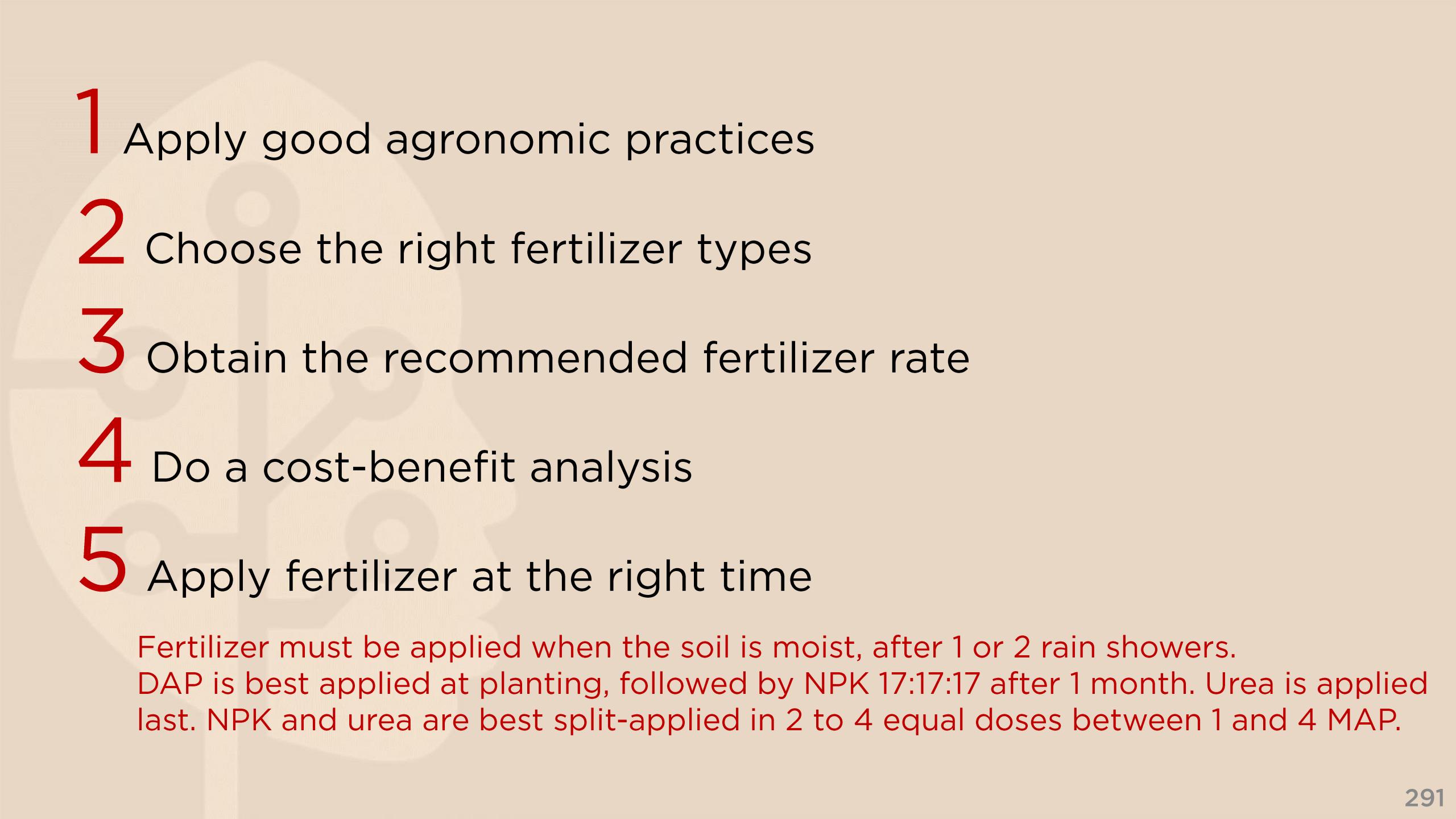
The recommended rate of fertilizer depends on the soil and weather in your area. We showed how you can obtain the recommended rate of urea, DAP and NPK 17:17:17 for your district, your planting month, and your current yield level.

- 
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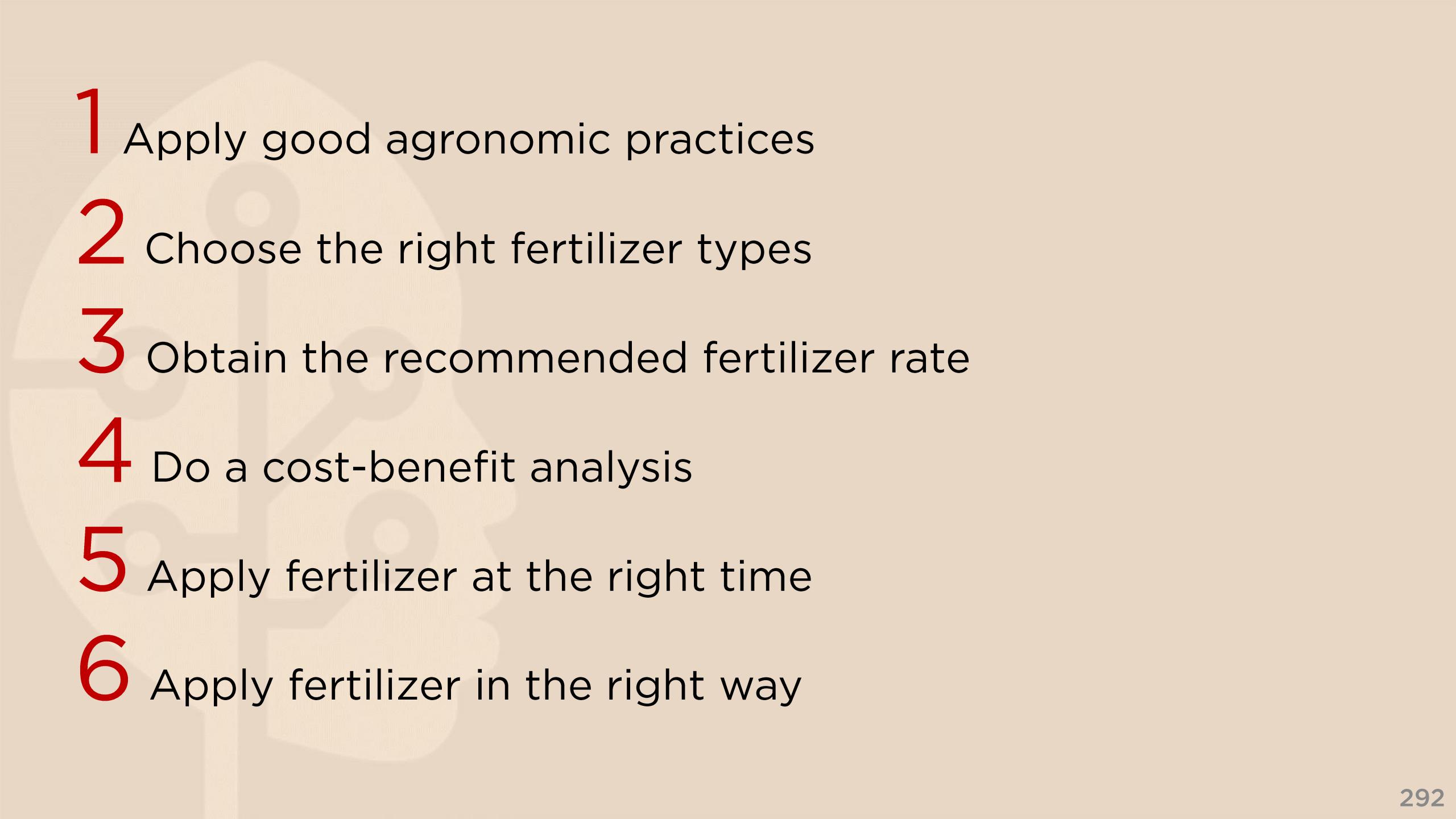
You must evaluate the profitability of fertilizer use before deciding to invest. Use your knowledge of how cassava performed in your field previously, the fertilizer price, and the expected cassava root price to calculate the expected extra profit.

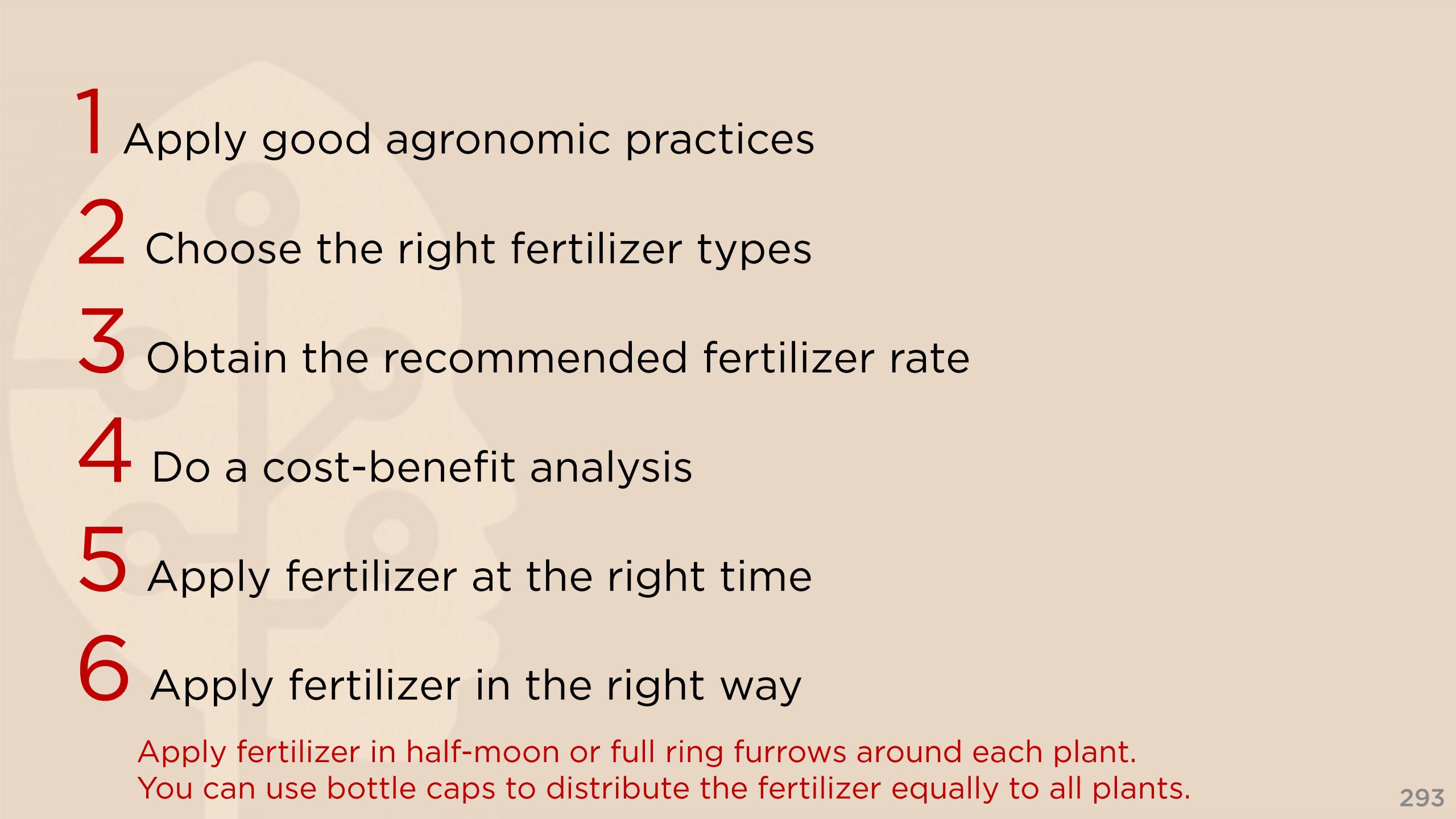
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- 1** Apply good agronomic practices
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 - 5** Apply fertilizer at the right time

Fertilizer must be applied when the soil is moist, after 1 or 2 rain showers.

DAP is best applied at planting, followed by NPK 17:17:17 after 1 month. Urea is applied last. NPK and urea are best split-applied in 2 to 4 equal doses between 1 and 4 MAP.

- 
- 1 Apply good agronomic practices
 - 2 Choose the right fertilizer types
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 - 4 Do a cost-benefit analysis
 - 5 Apply fertilizer at the right time
 - 6 Apply fertilizer in the right way

- 
- A faint background watermark shows a hand holding a fertilizer bag and a fertilizer spreader.
- 1 Apply good agronomic practices
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Apply fertilizer in half-moon or full ring furrows around each plant.
You can use bottle caps to distribute the fertilizer equally to all plants.



You now know all about

Tailored fertilizer recommendations

and how to use our printable guides

in **6** easy steps

Thank you for watching!



AKILIMO
we know cassava