Rwanda Agronomy: Lime, Lesson Plan

TOTAL TIME: 45 Min

AUDIENCE: Farmers

FACILITATOR: Farmer Trainer

LOCATION: Field

OBJECTIVES:

- **OBJECTIVE1: Describe the importance of lime in the soil**
- **OBJECTIVE 2: Farmers know when to apply lime and at what rate and cost**
- **OBJECTIVE 3: Farmers can apply lime at the correct rate**

MATERIALS:

- Enough Lime to be used on the demonstration plots,
- Sample measures for Lime for the correct rate.
- Plastic cups for making Lime measures (minimum of 5 for each Focal Farmer).
- Scissors to cut measures.
- Marker Pen to mark measures.
- Transparent Jar with Lime

TIME	CONTENT OUTLINE
5 min	**OPENING:** **Review Objectives:** ▪ In this training, we will look at the importance of lime in the soil, the cost and benefits of using lime and how to apply lime correctly. **ACTIVITY: Icebreaker** Select an icebreaker that is appropriate for your audience.
5 Min	**OBJECTIVE1: Describe the importance of lime in the soil** **ASK**: What is lime? **ANSWER:**

	▪ Lime is a natural product that is very high in calcium (the same mineral that is in your bones and teeth.)
	▪ There are 2 types of lime:
	  o Agricultural lime is Calcium carbonate.
	  o Dolomitic lime is Calcium and magnesium carbonate**.**
	
	PASS: Around the jar with lime for the farmers to see
	EXPLAIN: Lime is a natural product mined in Rwanda
	
	ASK: Why do you think farmers need to apply lime in coffee fields?
	ANSWER:
	▪ Plants need calcium just like humans.
	▪ Calcium is very important in the soil. If calcium levels are low, then other nutrients are not available to the plant. **So adding lime increases the availability of the nutrients already in the soil to your coffee trees**.
	▪ Many soils in Rwanda are deficient in Calcium and Magnesium so need both Agricultural lime and Dolomitic lime.

10 Min	**OBJECTIVE 2: Farmers understand how to apply lime, the recommended quantities, and its cost.** **EXPLAIN:** In 2009, TechnoServe, in collaboration with OCIR Café (now NAEB), conducted soil and leaf analyses in all coffee-growing districts of Rwanda. Based on this research, a map was developed showing the lime and other input requirements for each area in Rwanda. **Timing of Application**: Lime needs to be added to the soil during the dry period in July-September or January-February. Lime is a soil additive and not a fertilizer, so it is not directly taken up by the plant. If you apply lime in heavy rain it might be washed away. Lime is only applied once a year. ▪ **Type of Lime Applied**: For the first year you need to apply Agricultural lime, in the second year you need to apply Dolomitic lime. You will then **alternate** the type of lime you apply every year for the next 6 years. ▪ **Amount of lime Applied:** Lime **slowly** increases the levels of Calcium and Magnesium in the soil. Once Calcium and Magnesium rates are at normal levels you will need to apply less lime and less frequently, probably only every few years. **Quantity of Lime:**

Lime gradually increases calcium and magnesium levels in the soil.
Once calcium and magnesium reach adequate levels, reduce the quantity applied and use lime less frequently (for example, once every few years).
***Trainer's Note:** Inform farmers only about the lime rate required for their specific sector and the recommended rate for the current year.

Sectors Applying Lime in 2017/2018:

Sector	Agricultural Lime Rate
Kigoma, Cyanika, Kibumbwe, Kibirizi, Ngera, Rusenge, Gitambi	200g per tree
Kirimbi, Gihombo, Kanjongo, Nyakabuye, Gikundamvura	300g per tree

EXPLAIN:

- Lime is an affordable mineral that is mined in Rwanda.
- When farmers purchase lime collectively and buy directly from producers, the cost is approximately **60 RWF per kg**.
- If purchased from retailers, the cost is about **200 RWF per kg**, due to transport costs.

For a farm with 100 coffee trees, the cost of lime is approximately:

- **2,000 RWF, 4,000 RWF, or 6,000 RWF**, depending on the required application rate in the sector.

Cost of Lime for 100 Coffee Trees

Sector	Grams per Tree per Year	Total for 100 Trees	Estimated Cost (RWF)
Kigoma, Cyanika, Kibumbwe, Kibirizi, Ngera, Rusenge, Gitambi	200g	20 kg	4,000
Kirimbi, Gihombo, Kanjongo, Nyakabuye, Gikundamvura	300g	30 kg	6,000

EXPLAIN:
In the demonstration plot, we observed that the combined use of lime, NPK fertilizer, and good agricultural practices at the correct time resulted in a yield increase of more than **70% within two years**.
Lime is affordable, and farmers only need to sell a small portion of the coffee harvested from 100 trees to purchase it.

	ASK: Do you think using lime will provide a good return on your money? **CALCULATE:** How many kilograms of coffee would you need to sell to purchase lime, based on the current coffee price? Discuss this together.
20 Min	**OBJECTIVE 3: Farmers can apply lime at the correct rate** **ASK**: What is the best way to apply lime so it is applied at the correct rate? **ANSWER**: Using a measure. **EXPLAIN**: Using scales, we made these measures weigh 300g of lime. This is the right measure for you to use. **SHOW**: The measure **EXPLAIN:** You can use this measure to make more measures following these steps *Note to Trainer: Demonstrate process*: ▪ Fill the measure with lime. ▪ Pour this into another cup and mark the level of the lime. ▪ Pour out the lime and cut the cup where marked. ▪ You now have another measure and can continue to make more. ▪ We will leave a measure, which you can use to make more measures.

ACTIVITY: Applying Lime

a) DEMONSTRATE the application of lime to 1 tree following the steps below:
   a. REMOVE any mulch from the area where you are applying lime.
   b. HAND WEED if required. Remind farmers that it is important to keep their farms weed free at all times.
   c. MEASURE the correct amount of lime using the measure
   d. SPREAD the lime in a square under and around the trees leaving a space of 10 cm around the trunk.
   e. APPLY to the next tree so that the lime joins and all the ground is covered in lime.
   f. RAKE into the soil very lightly.
   g. PLACE mulch (under canopy/full as earlier demonstrated)
   h. WASH your hands and exposed skin when you finish
b) DIVIDE farmers into 5 groups and give each group a row of 8 trees and a measure.
c) ASK them to apply the lime to all trees working as a team.
d) VISIT each group and give feedback during the activity.
e) DISCUSS. Were there any challenges?

Note to Trainer: *Remember Lime is applied everywhere not just under the tree. Apply lime evenly in a* ***square*** *around each tree; join up the squares to cover all the ground. Then lightly rake- in before replacing the mulch.*

EXPLAIN:

- Because lime is not a fertilizer and is to improve the soil, you need to apply all over the soil/farm and not just under the tree canopy.
- Lime enables fertilizers like NPK and compost work better
- It is cheaper to buy lime in bulk as a cooperative.

5 min	**CLOSING:** **REVIEW KEY LEARNINGS**. **ACTIVITY: Knowledge check** ▪ Ask participants the following questions: o Why is lime important? o How much lime do you need to apply per tree? o Where do you apply lime? **QUESTIONS AND ANSWERS**