TECHNICAL GUIDE ON TEA REDENSIFICATION FOR SMALLHOLDERS IN UGANDA



For agricultural technicians and advisors



A guide by
Nitidae
November 2026

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WHY REDENSIFY TEA PLOTS ?

Most tea-producing areas in Uganda experienced a dramatic decline in fresh tea leaf prices between 2015 and 2025.

To cope, farmers reduced production costs by discontinuing essential practices such as replacing dead tea bushes, which is costly and labour-intensive.

This led to a significant loss of tea plot density, as shown in the photo on the right.



This guide proposes a renewed approach to tea plot redensification, adapted to the labour and cash-flow constraints faced by smallholder farming households.

Unlike redensification based on costly clonal planting material, the method presented here relies on the improved relocation of wildlings, i.e. naturally occurring tea shoots.

This method reduces redensification costs by 50% while maintaining survival and growth rates equivalent to or higher than those of clonal plants, making redensification more accessible to smallholder farmers.

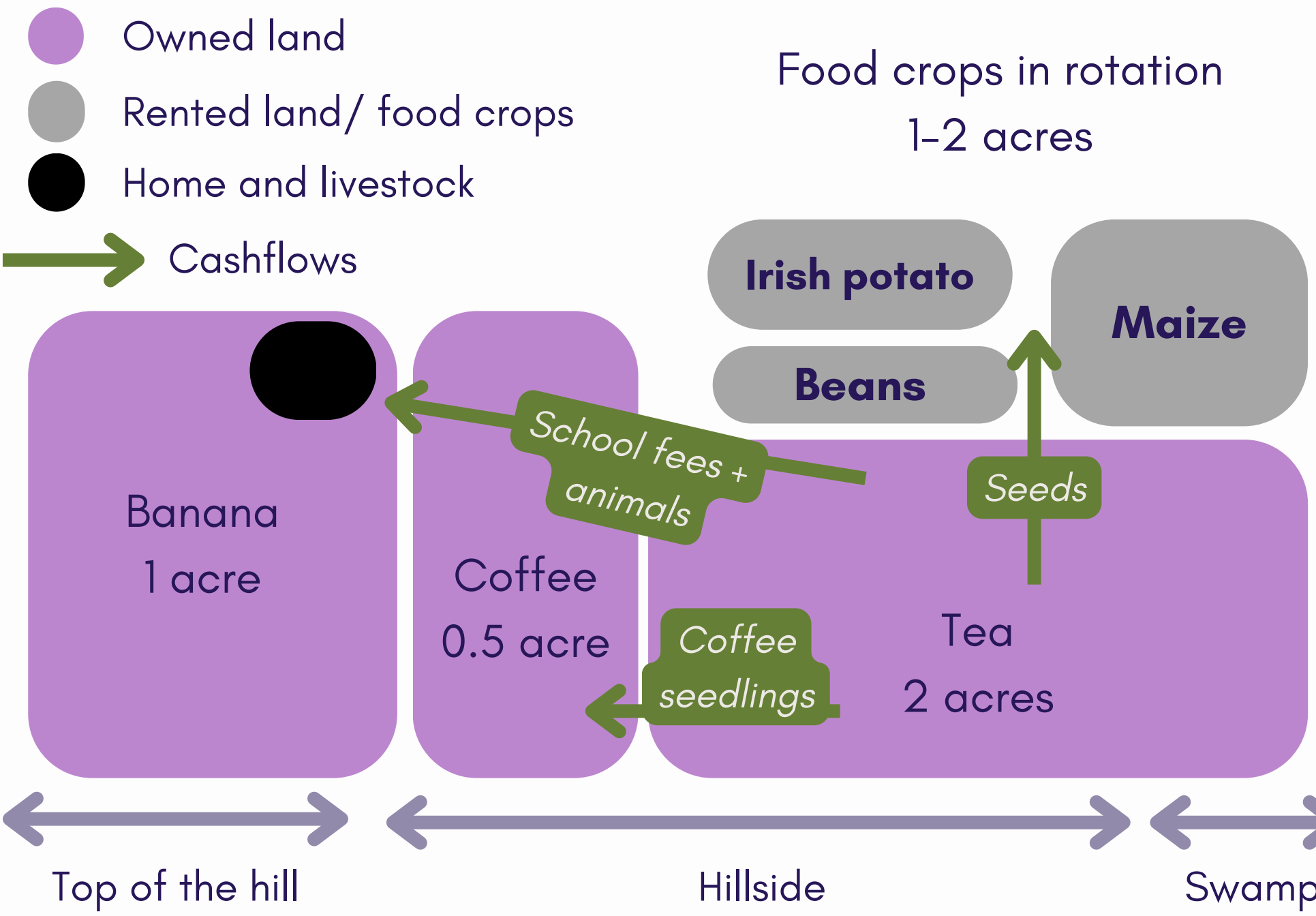
HOW TEA REDENSIFICATION CAN SUPPORT OTHER CROPS, INCLUDING COFFEE

Most family farms in Kabarole and Kyenjojo districts include different plots and cropping systems interconnected through flows of cash, labour, and soil fertility.

Tea is key because it provides monthly cash income to cover non-farm expenses (such as school fees) and farm expenses such as buying seeds for food crops or diversifying into coffee.

Tea redensification can therefore contribute to the agroecological transition through **a landscape approach**, helping to reduce farmers' economic vulnerability and **support other value chains such as coffee**.

Below is a diagram of a typical family farm in Kyenjojo District.



NITIDAE'S EXPERIENCE IN UGANDA

Nitidae is an international NGO working on biodiversity conservation, agroecological development and more sustainable value chains. With more than 300 staff members, Nitidae operates in around fifteen African countries, including Uganda since 2023.

In Uganda, we work in the districts of Kabarole and Kyenjojo and have supported the tea sector since 2023.

The loss of tea plantation density has emerged as a major challenge for farmers, resulting in lower yields and increased weeding workloads, as well as a biodiversity challenge due to widespread glyphosate use.

Given the prohibitive cost of redensification according to recommended good agricultural practices, we sought to develop alternative technical approaches inspired by existing farmer practices.

The method was developed and implemented with more than 50 farmers between 2024 and 2026 and validated through field trials under real smallholder farming conditions.

HOW TO USE THIS GUIDE ?

This guide first presents comparative results from redensification trials using wildlings and clonal plants. It then details the technical itinerary for the improved relocation of wildlings.

It is intended for agricultural technicians and organisations supporting tea plot redensification, including tea factories, cooperatives and NGOs.

SMALLHOLDER-BASED REDENSIFICATION TRIALS

Step 0 : Territorial diagnosis and focus on tea

Before starting the trials and technical support, a territorial diagnosis was conducted using spatial analysis and more than 100 technical and economic surveys.

This helped us understand the diversity of farming systems and the increasing economic vulnerability of smallholder tea farms.

In-depth interviews with 50 tea farmers, women and men, helped identify their cash-flow and labour constraints, as well as cropping-system challenges, including loss of tea plot density.

Step 1 - Co-designing trial protocols with farmers

Redensification was tested using two types of planting material:

- Clonal plants from cuttings developed by our technical team to ensure high-quality material and sufficient maturity for planting at the most favourable time of the season.
- Wildlings with a pencil size stem thickness and 20-50cm tall.



Clonal seedlings in a nursery bed

Step 1 - Co-designing trial protocols with farmers



Focus groups with farmers identified the technical factors they considered to influence the survival and growth of introduced tea plants.

This Knowledge, combined with a literature review and the expertise of a tea-production specialist, led to four treatments:

- Treatment A: Small planting hole with manure
- Treatment B: Small planting hole without manure
- Treatment C: Large planting hole with manure
- Treatment D: Large planting hole without manure



The hypothesis was that larger holes would improve soil water retention and survival and growth during the dry season, while manure would improve growth rates.



Wildlings planted under Treatment D, four months after planting.

Step 2 - Implementing the trial



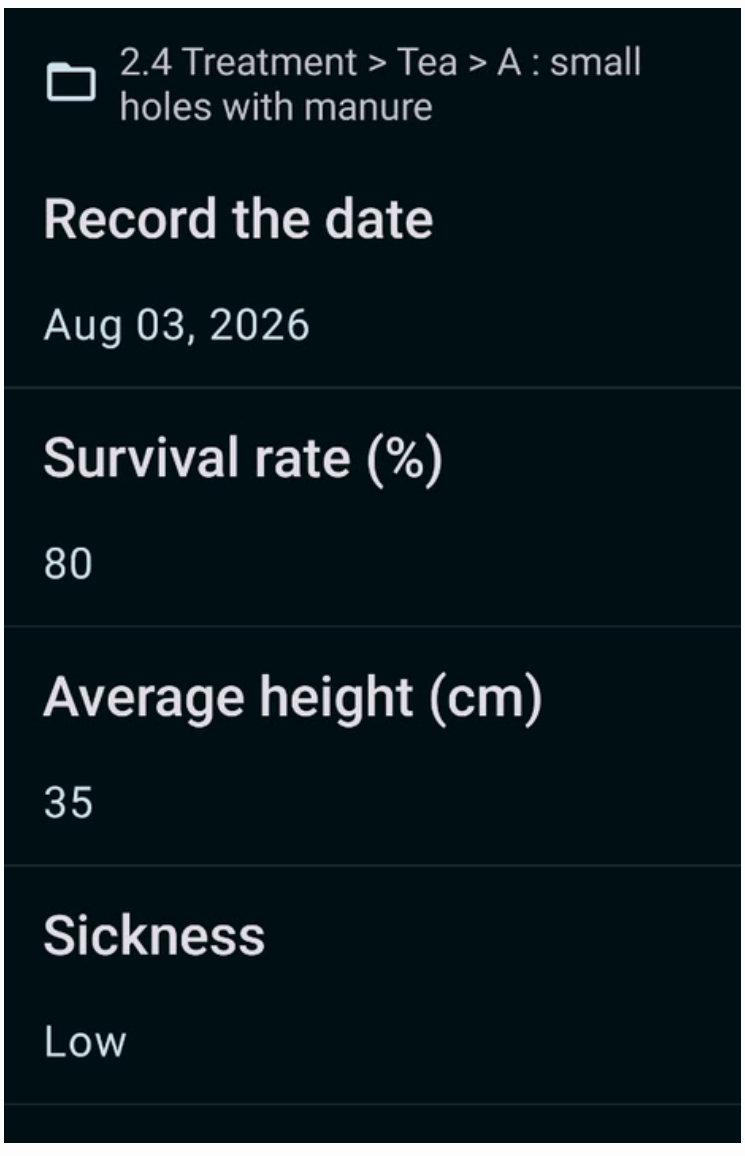
The technician was present at every stage (developing cuttings, harvesting wildlings, preparing holes and planting) to ensure that the defined treatments were properly implemented.



Step 3 - Monitoring and technical support

Using an ODK questionnaire, data on the condition of introduced tea plants were updated every two months, providing accurate information, particularly on survival and growth rates.

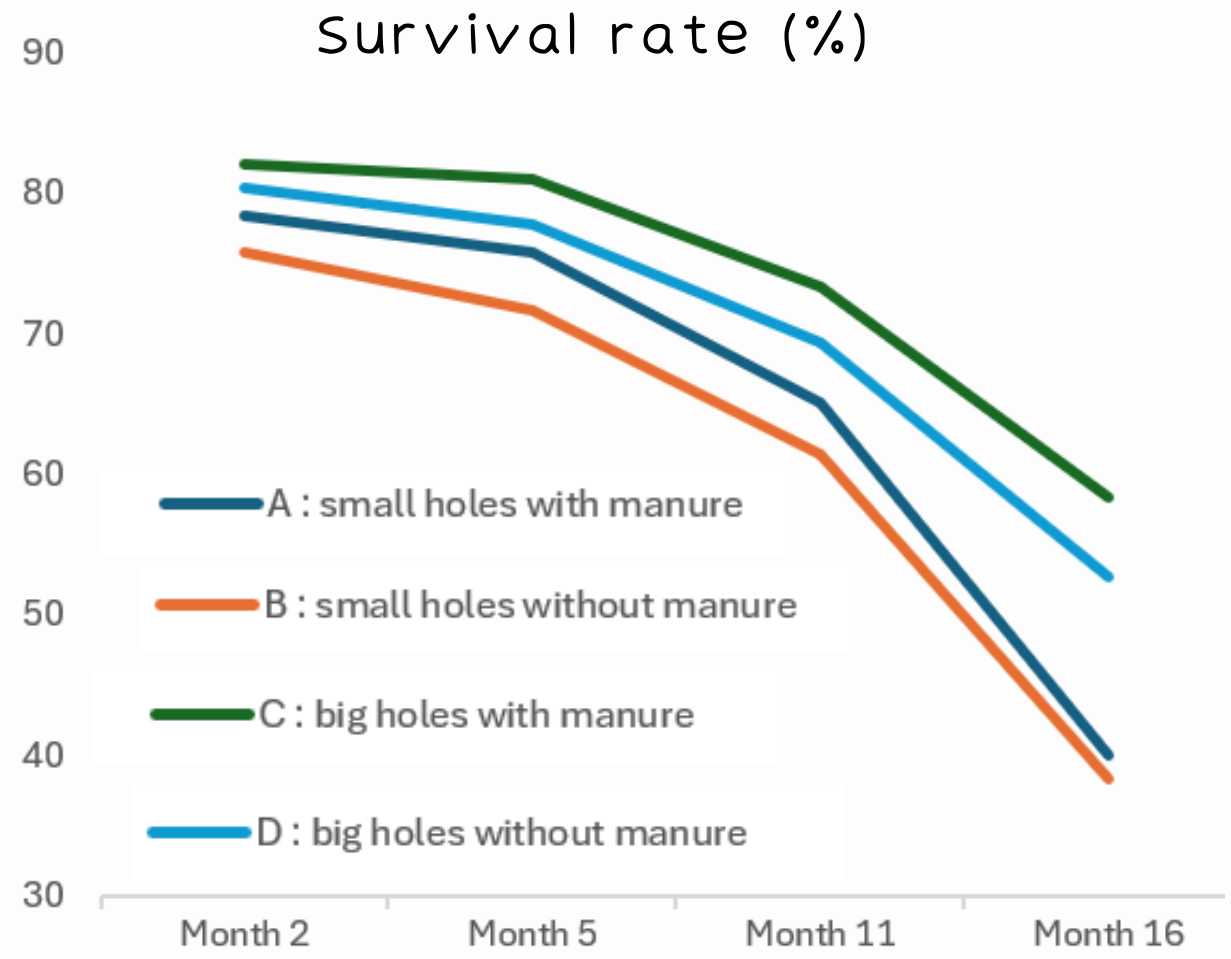
Additional technical advice was provided according to farmers' needs and difficulties.



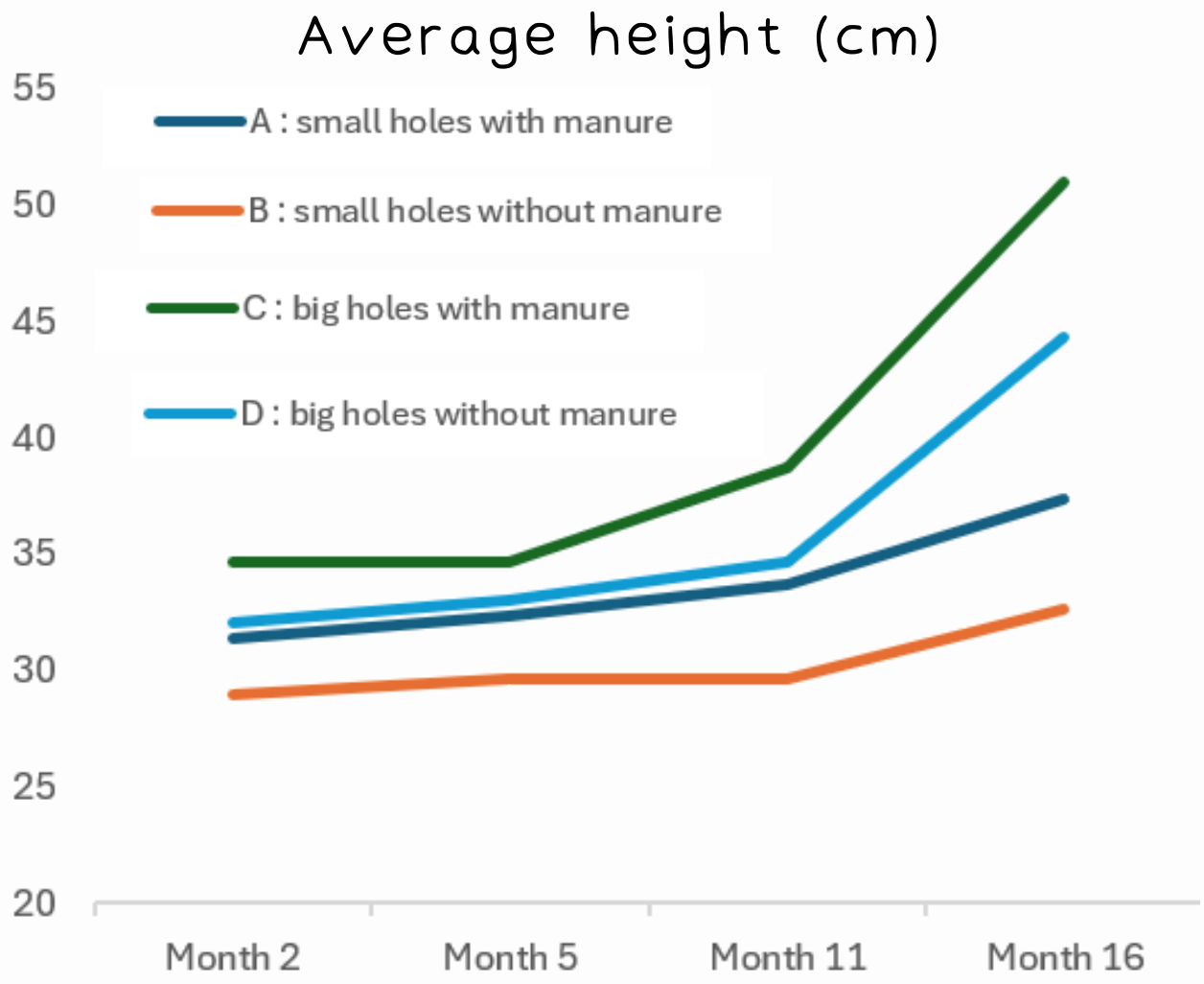
Screenshot of the ODK formulaire used to monitor the trials

RESULTS OF THE WILDLING TRIALS

Monitoring wildlings over 16 months made it possible to assess survival through two dry seasons, the most critical periods for tea plant survival.



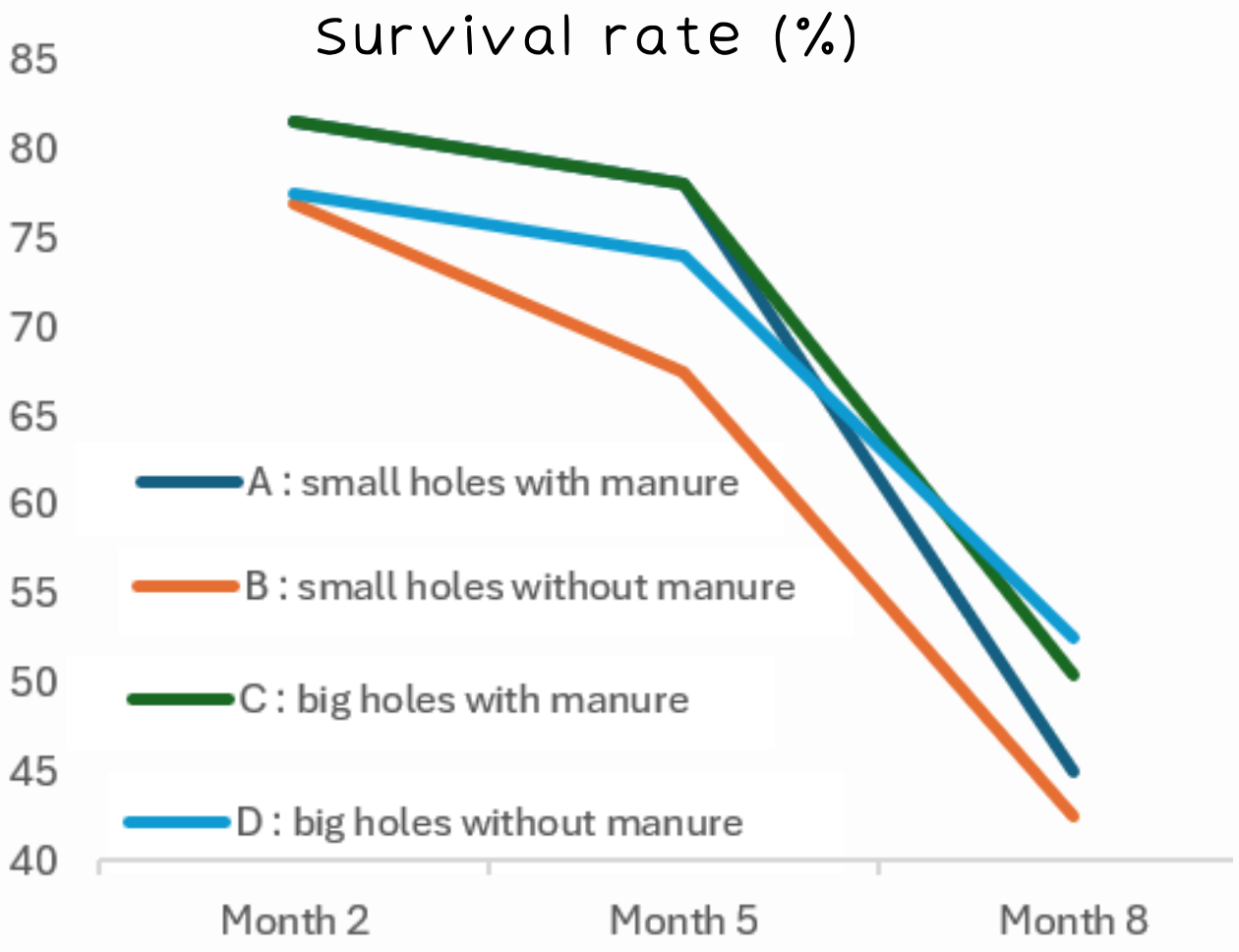
Differences between treatments become particularly significant after the second dry season.



The results clearly show that planting-hole size is the key factor influencing wildling survival and growth.

RESULTS OF THE CLONAL PLANT TRIALS

Monitoring clonal plants over eight months assessed survival after one dry season and showed a lower survival rate than wildlings monitored for twice as long.



Under equivalent treatments, surviving plants nevertheless reached a height equivalent to or greater than that of wildlings.



As with wildlings, planting-hole size appears to be the main factor influencing survival and growth.

COMPARISON OF CLONAL PLANTS AND WILDLINGS

For both clonal plants and wildlings, the treatment producing the highest survival and growth rates was, as expected, large planting holes with manure.

This treatment resulted in:

- 52% survival for clonal plants after 8 months
- 72% for wildlings after 8 months
- 53% for wildlings after 16 months

Wildlings therefore had a significantly higher survival rate than clonal plants.

A clonal plant costs approximately UGX 600, compared with an estimated UGX 200 for harvesting a wildling.

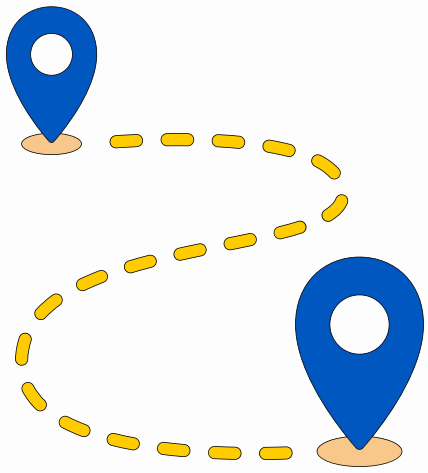
The improved wildling relocation method is therefore not only more efficient but also 2 to 3 times less expensive in terms of planting material.

Including planting labour, estimated at around UGX 200 per plant, total costs are approximately UGX 400 per wildling and UGX 800 per clonal plant.

TECHNICAL ITINERARY TO PROMOTE

In a smallholder context, we recommend promoting wildlings (with a pencil size stem thickness and 20-50cm tall) planted in large holes, with or without manure depending on farmers' available resources and financial capacity.
The technical itinerary is detailed in the next pages.

TECHNICAL ITINERARY FOR TEA REDENSIFICATION WITH WILDLINGS





A low density tea plot in the district of Kabarole

STEP 0 : IS REDENSIFICATION NEEDED ?

- To maintain good yields with low maintenance and weeding, tea bushes should have their canopies in contact.

- If significant gaps are visible in the plot, redensification is technically needed.

My approach as a good agricultural officer

Redensification may be technically useful, but it may not be suitable for every farmer, depending on their labour and cash-flow constraints.

First, I need to asK the farmer two questions :
1/ is your weeding worKload an issue ?
2/ If I show you a method of redensification with a survival rate of 50-80% and with a cost of 200 UGX/plant, will you invest time and money ?

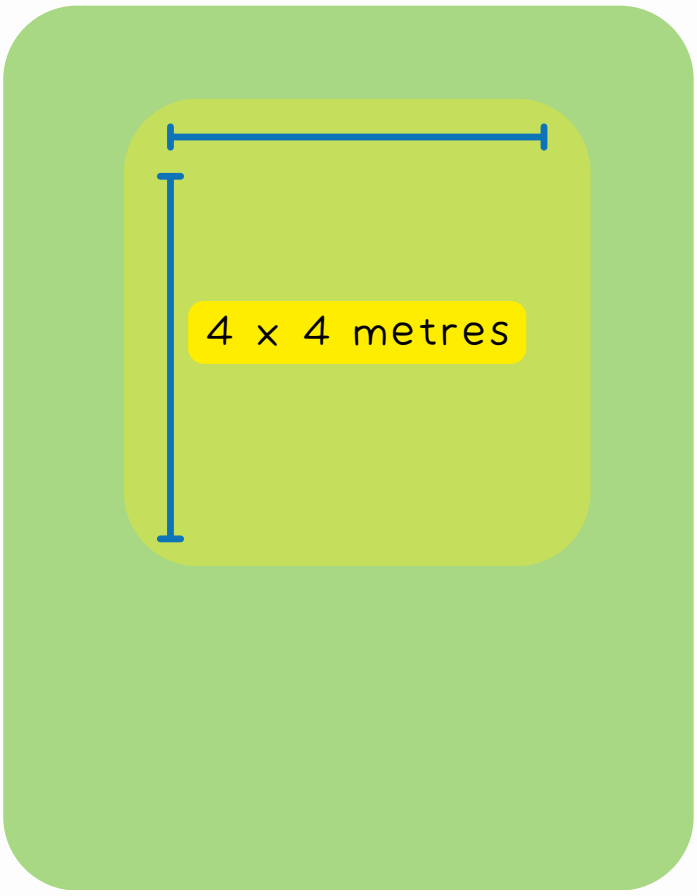
If he/she answers positively, then I can technically assist him/her with redensification.





STEP 1 : ASSESS THE NEEDS

- Select one representative 4 × 4 metre square within the target tea plot. Choose an area that reflects the overall condition of the plot, avoiding particularly dense or sparse areas.
- Count the number of tea bushes within the square. For example: 10 bushes.
- Multiply by 250 to estimate the number of bushes per acre. For example: 10 × 250 = 2,500 bushes per acre.
- The minimum recommended density is 4,000 bushes per acre.
- The replanting requirement is therefore: 4,000 - 2,500 = 1,500 wildlings per acre.



My approach as a good agricultural officer

If the farmer has three acres, the number of wildlings needed can quickly become very large.
I should therefore advise the farmer to start with a number of wildlings that they believe manageable.
And they can increase the redensificated area season after season.





Timing is Key

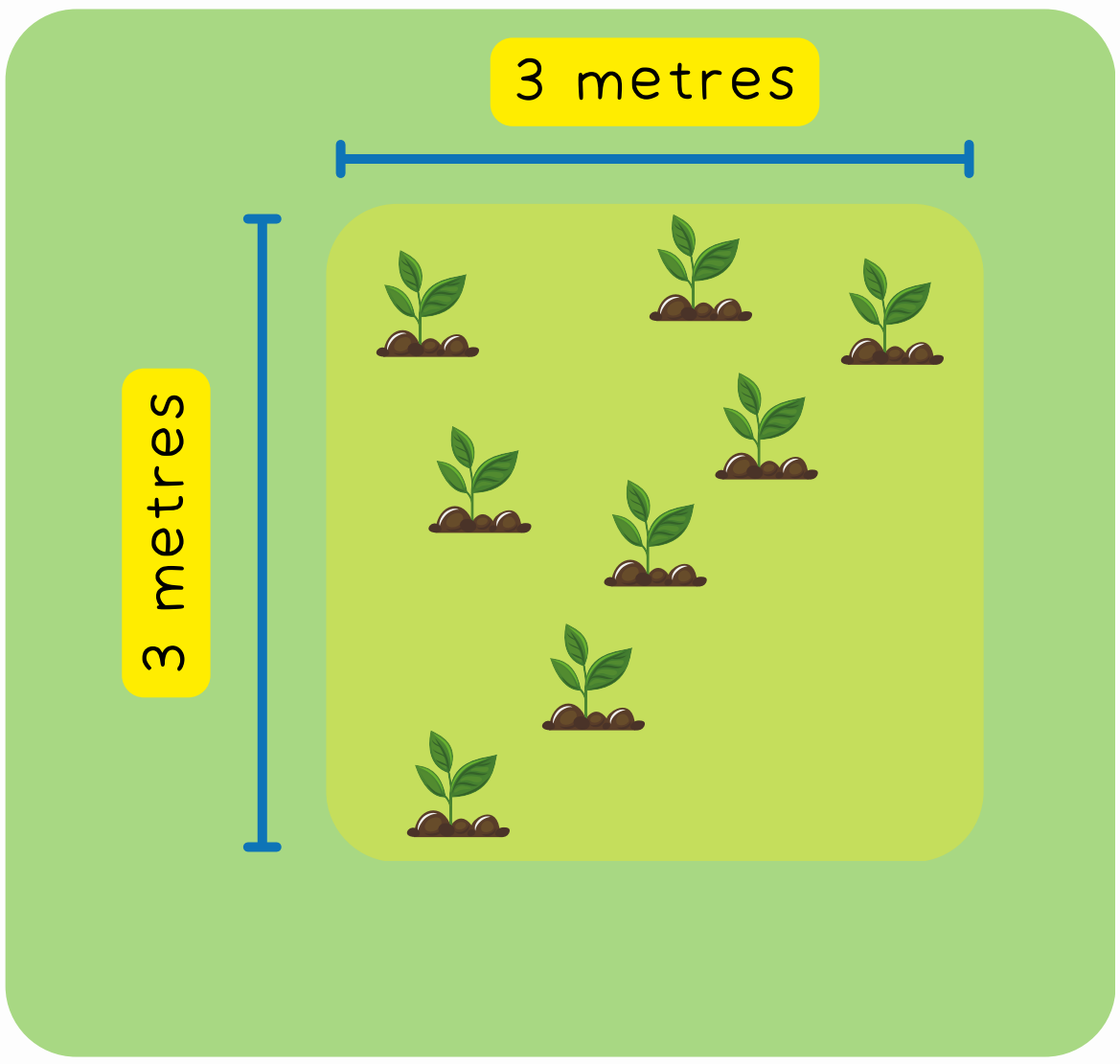
Redensification can't be planned any time of the year. Wildlings need to be planted at the beginning of the rainy season, either in October or February in Uganda. The mother garden should therefore be identified 2 weeKs before planting.



STEP 2 : CHOOSE THE MOTHER GARDEN

- Select a healthy tea plot with the desired varieties
- Select a tea plot that has not been pruned for more than 3 years, to ensure a good density of wildlings

A typical healthy mother garden



Additional tip :)

If redensification is planned on a large scale, select a mother garden with at least 5000 wildlings per acre, equivalent to 10 wildlings in a 3 × 3 metre square.

STEP 3 : SELECT THE WILDLINGS

Select wildlings with :

- a pencil size stem thickness,
- 20-50cm tall,
- a straight taproot,
- and a healthy vegetative growth.



Example of suitable wildlings with a straight taproot, circled in red.

STEP 4 : UPROOT THE WILDLINGS



Timing is Key

When should the wildlings be uprooted?

1. When the soil is very moist, so that most of the root system can be removed.
2. Early in the morning or in the evening, to avoid water stress.

Wildlings are usually uprooted by hand. However, it is better to use a hoe, spade or shovel to remove most of the root system and improve the survival rate.
Be careful not to damage the roots of the mother plants when using these tools.



Under ideal conditions, 30 wildlings can be collected in one hour. This means that one person can collect 240 wildlings in one day.
If the objective is to redensify one acre with 1,200 wildlings, this would require 5 full working days.
This is the main labour cost of wildling redensification.





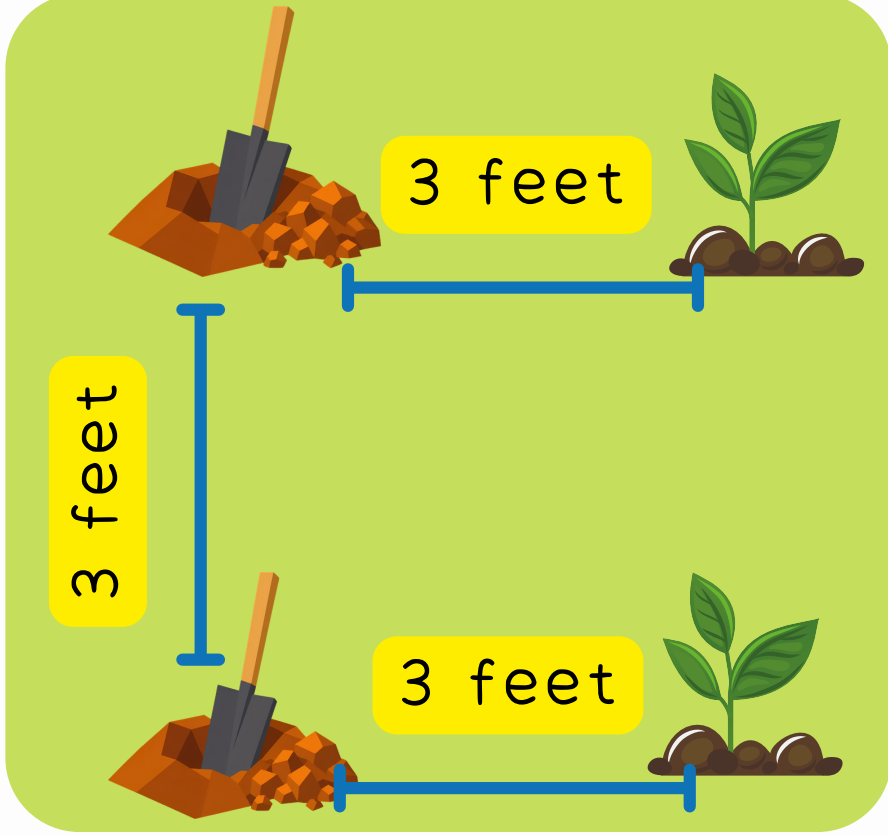
Wildlings wrapped in a wet towel

Additional tip :)

If the tea plot is not yet ready for planting, the wildlings' roots can be kept in water, covered with moist soil or wrapped in a wet towel for up to 2 days. In all cases, keep the wildlings in the shade.

STEP 5 : MARK OUT THE HOLES

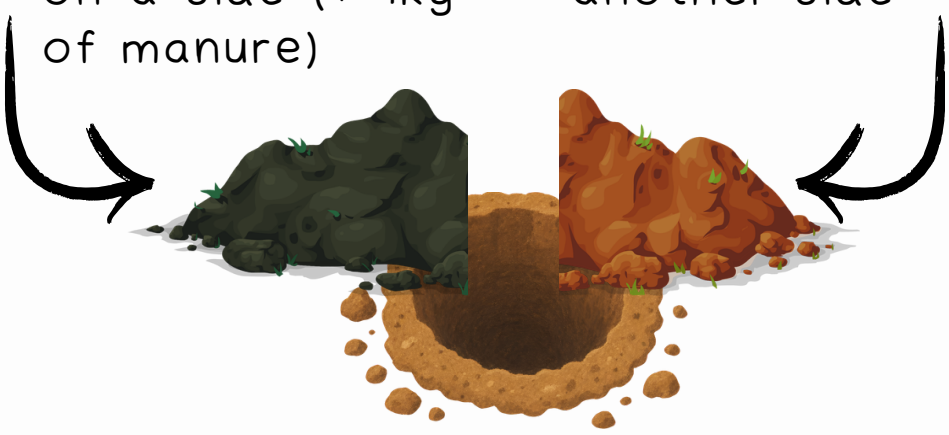
- Mark the holes to be dug with sticks.
- Each wildling should be planted 3 feet from another wildling or from an existing tea bush.





STEP 6 : DIG THE HOLES

- The holes must be 2 feet deep and large.
- Keep top black soil and red deep soil in separate piles.



STEP 7 : PLANT THE WILDLINGS

- Refill the hole with black soil first, then red soil.
- Within the refilled hole, dig a small hole for the wildling.
- The soil must cover the wildling to the same level as it was in the mother garden.
- Press the soil around the wildling to ensure it is firmly planted.
- Avoid leaving depressions where water could accumulate.
- If there is no rain on planting day and water is available, water the wildlings.



Newly planted wildling

STEP 8 : MAINTAIN THE WILDLINGS

- Weed regularly around the wildlings.
- Keep wildlings visible to prevent accidental damage by workers.



HOW ABOUT A QUICK RECAP ?

THE ESSENTIALS

- When? At the beginning of the rainy season.
- From where? A healthy mother garden with many wildlings.
- Which wildlings? Healthy wildlings, 20-50cm tall with a pencil-thick stem and a straight taproot.
- How to uproot? With a hoe or shovel on moist soil.
- How to plant? In 2-foot-deep holes, keeping the deep and topsoil separate.
- How many? 3 feet from another wildling or an existing tea bush.
- How to maintain? Weed regularly around the wildlings.

ADDITIONAL TIPS

- Mix 1 Kilogram of manure with the topsoil.
- Water at planting if there is no rain.
- Each time you try the method, you will learn more about how to adapt the technical itinerary to local conditions, including the size of the holes and the planting period.

WARNING POINT

- Redensification is very labour-intensive. Plan it over small areas at different times, rather than over a large area all at once.



THE COST OF REDENSIFICATION

To redensify one acre with an average of 1,500 seedlings, you will need to spend :



With clonal plants

- 600 UGX per seedling
- 200 UGX for labour per seedling

= 800 UGX x 1500 seedlings =
1.2 million UGX =
300 US Dollars



With wildlings

- 200 UGX per seedling
- 200 UGX for labour per seedling

= 400 UGX x 1500 seedlings =
0.6 million UGX =
150 US Dollars

ACKNOWLEDGEMENTS

This guide was developed by NITIDÆ with the support of a grant from the Ecotone Foundation, a foundation committed to biodiversity conservation.
This partnership reflects NITIDÆ's objective of developing activities that combine biodiversity conservation with the strengthening of local economies.
We would like to thank everyone who contributed to this work, including Noémie Rullier, Cédric Rabany, Lucas Veysman, Léna Orhant, Joad Mugisha and all the NITIDÆ colleagues who provided support in the field, with logistics, technical input and reviewing.
We also warmly thank the farmers who took part in the trials and shared their time, experience and knowledge. Their contribution was essential to testing and developing this practical approach to tea redensification.

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LEARN MORE ABOUT NITIDÆ'S WORK IN UGANDA

This work is part of NITIDÆ's broader activities in the Kibale landscape, supporting the development and structuring of sustainable value chains, including coffee, tea and cocoa. These activities aim to promote value chains that contribute to the conservation of biodiversity and support more sustainable farming systems.

NITIDÆ is also involved in SATAF, a European Union-funded project that aims to characterise, assess and scale up agroecological systems through value chains, with a focus on coffee and cocoa in Uganda. The project is implemented with several partners, including the European Forest Institute (EFI) and CIRAD.

To learn more about NITIDÆ's activities in Uganda, visit www.nitidae.org/en

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