

Triple S: Training Materials for Scaling



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Current status of initial scaling



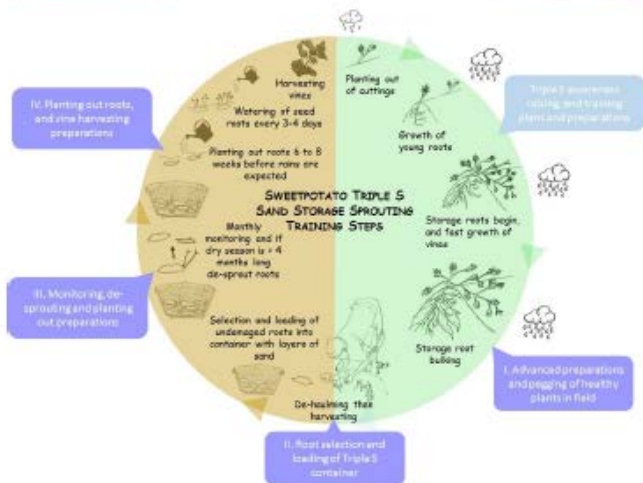
Country	Status	TOT conducted	No. districts	No. target HH	Actual (2016-17)	Funding	Expected completion
Uganda	Scaling	Ongoing	5	tbc	1,500 (accumulative)	HarvestPlus	New MENU project started 2017
Ethiopia	Testing completed		4 (SNNPR) 2 (Tigray)		147 (F:38%)	SASHA2,	Completed
Ethiopia	Scaling	ToT & demos	7 (SNNPR)		ToT: 119 Ext. 20 demos: (2,328 HH)	(BPBL), IA, Emergency project	Completed
Ethiopia	Scaling	Planned	8	15,000		QDBH-EU project	2020 (tbc)
Mozambique	Scaling	May-16	6 (23 sites)		134	VISTA,	Dec-16 (New project)
Mozambique	Scaling	May-16	4 out of 8 planned (10 sites)	960	77	Irish Aid	Dec-17
Tanzania	Test & scale	June-16	7	120	155	VISTA	Jun-17 (Endline: August 2017)
Kenya	Test & scale	March-May -16	3	400	400 (F:66%)	SUSTAIN & SASHA	Aug-17
Nigeria	Test & scale	Oct-Nov 16	14	tbc	62	Jumpstarting	Mar-17
Malawi	Planned	Required	tbc	tbc		MIIST (USAID)	
Ghana	Test & scale	Oct-Nov 16	6	tbc	178	Jumpstarting	Mar-17
Burkina Faso	Testing	ToT	5	100	5 DVMs 54 HH & Ext.	Jumpstarting	Mar-17

Guide for Trainers



Guide for Trainers

Sweetpotato Planting Storage Material Conservation Triple S method: Sand, Storage, Sprouting



- Designed around a framework of 4 training sessions to fit the crop cycle
- Contains outline plans for each Triple S training sessions
- Step-by-step instructions on how to set-up a Triple S system
- Detailed discussion of **why, when and how** each step is done
- Visual illustrations of each stage
- Use together with the Triple S training flip charts and farmer handouts

TRAINING SESSION 1. TRIPLE S EXPLANATION, PLANS AND PREPARATIONS	
Participants will: <ul style="list-style-type: none"> • understand how Triple S can ensure sufficient sweetpotato planting materials are available at the start of the rains and how this can benefit different types of households; • know what is required to set up a Triple S system; • be able to use their seasonal calendar to work out when their Triple S activities need to occur; • be able to identify and mark healthy plants in the field for subsequent Triple S use; • have planned who they will each be sharing the Triple S technique with. <p>When: at root bulking stage (~1 month before harvesting)</p>	
Topics	Suggested learning activities
<ul style="list-style-type: none"> - Introductions - Triple S: what is it, how does it help - Overview of Triple S training session plans - Developing their Triple S calendar - Calculating their Triple S requirements - Equipment for Triple S - Selecting and marking healthy plants to use for Triple S - De-hauling to help cure sweetpotato roots - Looking ahead to the next session 	<ul style="list-style-type: none"> • Ice breaking introductory activity (see suggestions in Appendix 1) • Quick run through of the day's aims, programme and timings • Presentation: use flip charts 1-5, and probing questions <ul style="list-style-type: none"> ○ how can Triple S help improve your food security? ○ when should you store your Triple S roots? ○ when do we expect the rains to start here, are there any signs to watch out for? ○ when would this mean we need to start planting out and watering our Triple S stored roots? ○ enter the months for each activity on your handout calendar ○ how much planting material will we get from 40 Triple S roots, and over how many weeks of vine harvesting? ○ what equipment does each farmer require for Triple S? • Field activity: move to nearby sweetpotato field, ask participants to walk through the crop and carefully observe the plants. Discuss the group's observations. Ask 3 of them to walk through the field again and to stop where they find a diseased plant, join them and discuss the importance of not using roots from diseased plants for Triple S storage, and the need for roguing of virus infected plants. Find a healthy plant and discuss its characteristics. Then ask group to get into pairs, give each pair 5 sticks, and ask them to use the sticks to mark healthy plants they find and could use the roots of for Triple S. Ask each pair to join another pair and check their selection of healthy plants. Discuss, demonstrate and plan for de-hauling • Demonstration: Setting up and loading a Triple S container • Group activity: plan how each will train 10 other farmers. Trainer to take records for follow-up in next session. • Overview of next session, what will be covered and fix date
Materials: <ul style="list-style-type: none"> □ Nearby field of sweetpotato at root bulking stage, so participants can practice identifying and marking healthy plants to provide roots for use in Triple S □ Short sticks to use for marking healthy sweetpotato plants □ Equipment for facilitator to demonstrate Triple S (basin, newspaper or silt sack, coarse dry sand, ~60 sweetpotato roots) □ Triple S training flip chart, trainer's guide, farmer handout 1 □ Farmers' should bring their own note books and pens 	



Training Flipcharts



STORING IN SAND AND SPROUTING SWEETPOTATO TRIPLE S TRAINING CHARTS

Sand, Storage, Sprouting Sweetpotato Triple S system

What is Triple S?
Sand, Storage and Sprouting are the initial steps for producing sweetpotato planting materials in time for the start of the rains, using seed roots stored during the dry season.

What constraints does Triple S address?
Lock of sweetpotato planting materials at the start of the rains

What does Triple S involve?

- Storing roots in dry sand
- Planting the sprouted roots out 6-8 weeks before the rains, and watering them
- Harvesting planting materials at the start of the rains

Timing of Triple S activities

Country	Harvesting, root storage & storage of Triple S roots	Dry season (no rain)	Start of rains (3-4 days)	Planting out in sand & watered for 6-8 weeks	Start of rains (one harvesting & planting of cuttings)
Kenya	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Uganda	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Malawi	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Zambia	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Senegal	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Guinea	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Sierra Leone	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Liberia	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Ivory Coast	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Ghana	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Benin	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Nigeria	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Cameroon	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
Cote d'Ivoire	April-May	June to Sept 30	Nov/Dec	Oct-Nov	Jan-Feb
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Planning for Triple S

The sweetpotato crop cycle

Equipment needed

- Basin or similar container
- Newspaper
- Coarse, dry sand
- 50 undamaged Fork hoe
- medium-small sized roots
- Stricks for pegging healthy plants
- Watering can

Triple S calculations
How much planting material from how many roots

1 Triple S root will generate ~40 cuttings

A Triple S basin holding ~50 roots will generate ~2,000 cuttings (50 x 40 = 2000)

One month later the vines can be harvested again (second vine harvest) generating another ~2,000 cuttings

Three cuttings are planted per square metre. So, 2,000 cuttings are sufficient to plant an area of ~650 m² (0.15 of an acre). So 1 Triple S basin provides enough cuttings to plant at least 0.3 acre (0.15 x 0.15 acres), or some of the cuttings can be sold.

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Using healthy roots for

Selecting healthy plants in the field from which to harvest (Positive selection)

One month before harvest, walk through your field and select healthy plants.

Two weeks later, re-check the pegged plants to make sure they are still healthy.

Only use roots from healthy plants as Triple S roots. This will prevent any diseases that reduce sprout vigour and yield.

De-hauling: At 3-5 days prior to harvesting, cut the foliage off your pegged plants leaving 10 cm of stem. This causes changes in the root which will protect it during storage, and will enable you to check if any stems have weevil tunnels in them.

Careful harvesting

Careful harvesting
Damaged roots will rot during storage. Harvest roots for Triple S carefully, use a fork hoe and work slowly. Place roots in shade, do not wash them. Transport the roots home carefully, do not overload, drop or sit on the sack.

Root selection

Select undamaged/healthy roots
Your Triple S roots will be stored for several months, so only store undamaged roots. Discard weevil damaged roots. Check carefully, as weevils lay eggs in tiny holes they make on the root, and the eggs hatch into larvae and can feed and bore in your Triple S roots. Discard broken or damaged roots. As they are more likely to rot during storage. Do not use roots from virus infected plants.

What size roots to store?
Small sweetpotato roots will dry out and shrivel during storage, while only a few large roots will fit in the basin. Choose small to medium sized undamaged roots, that are about as thick/wide as the handle of your hoe (~2-5 cm diameter) for use in Triple S. Note in areas where the dry season is > 7 months, medium to large roots are preferred.

Preparing and loading your Triple S container

- Once you have selected your healthy, undamaged, small to medium-sized roots. Gather all your equipment. Plan where you will store your Triple S during the dry season, so that it can remain dry, and cool.
- Add a layer of cool, dry, coarse sand. You can sweep this sand from around your yard, but make sure it is cool before using it, and free from soil.
- Next add a layer of roots, make sure the roots do NOT touch each other.

Loading your Triple S container

- Then cover the roots with a layer of cool, dry, relatively coarse sand.
- Add another layer of roots, making sure they do not touch each other or the edge of the basin.
- Cover them with a layer of cool, dry, coarse sand.
- If there is space, add a third layer of roots.
- Always finish with a deep layer of sand (~10 cm thick). This will help prevent the roots from drying out during storage, and stop weevils or rats from finding and damaging them.
- Take care of your Triple S, ensure:
 - chickens cannot dig in the sand
 - a thick top layer of sand to avoid rats
 - it will not get rained on, or too hot
 - the family know about the Triple S, so that no one eats the roots, as they are the link to next year's food
 Check your Triple S regularly.

Monitoring your Triple S

De-sprouting your Triple S stored roots

Preparing the root bed, planting out and watering your Triple S roots

Vine production from planted Triple S roots

Benefits of Triple S

Training other farmers

All training is an investment. We need to plan how to maximise the impact of the training when we have limited resources. We need to ensure that the training is relevant to the needs of the farmers. We need to ensure that the training is practical and that the farmers can apply what they have learned. We need to ensure that the training is sustainable and that the farmers can continue to improve their skills and knowledge over time.

Farmers' Handouts



SWEETPOTATO TRIPLE S – AN OVERVIEW

What is Triple S?

Triple S stands for Sand, Storage and Sprouting which are the 3 main steps used for storing sweetpotato roots to conserve planting materials during the dry season.

The roots are stored in coarse dry sand, and then planted out and watered before the rains arrive so their sprouts can grow and provide planting materials at the start of the rains.



Equipment needed:

Old basin, or other container for storing the roots in



Old newspaper for lining the basin



Coarse, dry, cool sand – which can be swept from the yard



Small to medium-sized undamaged sweetpotato roots



Sticks to peg plants



Fork hoe to harvest



Watering can



Why use Triple S?

The shortage of planting materials at the start of the rains, is a major challenge to sweetpotato farming across sub-Saharan Africa. Access to planting materials at the start of the rains, would enable households to plant a larger area of sweetpotato and to start harvesting a few roots within 3 months to help nourish them during the period of the year when many households are hungry.

Using Triple S can help in many ways, as:

- Triple S provides sweetpotato planting materials at the start of the rains
- Planting sweetpotato early provides food during the hungry season
- Sweetpotato roots harvested early in the season fetch a high price at market
- Sweetpotato yields and areas are increased
- Sweetpotato is a low cash input crop, Triple S helps resource-poor households harvest sufficient food
- Households do not have to spend time searching for vines
- Sweetpotato is relatively drought tolerant helping to provide food in less predictable climatic conditions

Triple S calendar

Triple S activity timing and calendar

Before harvest: Healthy plants with 10-15 leaves and 15-20 cm roots are ready for harvest.

At start of rains: Harvest 10-15 roots per household. Store in Triple S.

After harvest: Harvest 10-15 roots per household. Store in Triple S.

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SETTING UP YOUR SWEETPOTATO TRIPLE S SYSTEM

A: Selecting healthy roots for your Triple S

Only store healthy roots in your Triple S. Walk through your field and peg healthy plants (~25 plants per Triple S basin you will set-up).



C: Careful harvesting

Harvest carefully to avoid damaging the roots. Work slowly, using a fork hoe may help. Place roots in shade. Do not overload sacks, or drop or squash roots during transport.



E: Preparing and loading your Triple S container

1. Gather all your equipment (clean basin, newspaper, coarse dry sand, undamaged roots)

2. Line the basin with newspaper

3. Add another layer of roots, making sure they do not touch each other

4. If you have space, add a third layer of roots

5. Store your loaded Triple S basin in a cool, shaded dark place, where it is safe

6. Harvest 10-15 roots per household. Store in Triple S.

7. Harvest 10-15 roots per household. Store in Triple S.

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9. Harvest 10-15 roots per household. Store in Triple S.

10. Harvest 10-15 roots per household. Store in Triple S.

11. Harvest 10-15 roots per household. Store in Triple S.

12. Harvest 10-15 roots per household. Store in Triple S.

13. Harvest 10-15 roots per household. Store in Triple S.

14. Harvest 10-15 roots per household. Store in Triple S.

15. Harvest 10-15 roots per household. Store in Triple S.

16. Harvest 10-15 roots per household. Store in Triple S.

B: De-topping sweetpotato plants to cure roots

Cutting the foliage off the pegged healthy plants 3-5 days before harvest, helps their roots to produce a thicker skin which protects them from disease and loss during storage.



D: Root selection

Due to the long storage period, only healthy roots should be stored. Harvest them from healthy mature plants (e.g. signs of soil cracking, yellow lower leaves).



F: Monitoring your Triple S stored roots

Every month, check your Triple S. Unload all the roots, one-by-one and discard any that are rotten or weevilled. Reload the Triple S basin as per at set-up.

The newspaper layer may need replacing.

Keep records of any observations and actions.

1. Harvest 10-15 roots per household. Store in Triple S.

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MONITORING, DE-SPROUTING AND PLANTING OUT YOUR TRIPLE S ROOTS

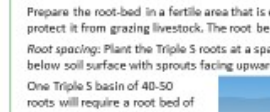
F: Monitoring your Triple S stored roots

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G: De-sprouting of sweetpotato roots in Triple S

Only de-sprout your roots if your dry season is more than 4 months long. If dry season is 5 months, de-sprout at 2 months. If dry season is >5 months, de-sprout at 3 months.



H: Preparing the root bed

Triple S roots should be planted out 6-8 weeks before the rains are expected to start. Prepare the root-bed in a fertile area that is easy to water and monitor. Fence the root-bed to protect it from grazing livestock. The root bed can be a flat or a raised bed.

Root spacing: Plant the Triple S roots at a spacing of 60 x 60 cm (~2ft x 2ft) and a depth of 10cm below soil surface with sprouts facing upwards.

One Triple S basin of 40-50 roots will require a root bed of about 6m x 2m, or 3m x 4m.

In areas where water is severely limited, you may want to plant roots at 30 x 30 cm (~1ft x 1ft) and form a depression between roots for water.

1. Harvest 10-15 roots per household. Store in Triple S.

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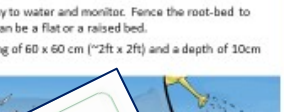
I: Watering your Triple S roots

Water your Triple S roots every 2-3 weeks. Watering should be done 1-2 weeks before harvest. To further the vines before harvest, watering should be increased to 1-2 weeks before harvest.



J: Harvesting and planting

Use 1st/2nd/3rd vines from Triple S roots. Harvest 10-15 roots per household. Store in Triple S.



K: Watering your Triple S roots

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Towards scaling



- Through Seed Systems CoP, projects and partners requested training materials
- Triple S calendar key for adapting principle principles to local context
- Integration of complementary technologies:
 - Double S – sand box storage
 - GAPs
- Partners from government extension and NGOs
 - SP value chains will pull demand for storage and seed
- Communication for behaviour change through mass media, radio, participatory videos, and women centered social networks
- Continued awareness, advocacy and investment for scaling through SPHI