

# Good Agronomic Practices for Safe Groundnut Production in Ghana

## Video Facilitator's Guide





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## **ABOUT SPRING**

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a seven-year USAID-funded cooperative agreement to strengthen global and country efforts to scale up high-impact nutrition practices and policies and improve maternal and child nutrition outcomes. The project is managed by JSI Research & Training Institute, Inc., with partners Helen Keller International, The Manoff Group, Save the Children, and the International Food Policy Research Institute.

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# Introduction to the Good Agronomic Training Video on Groundnut Aflatoxin Management and Control in Groundnuts

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## Background

Groundnuts are a major legume crop in the northern regions of Ghana and provide important nutrients for physical development. When handled improperly, however, groundnuts can be toxic to humans. Certain types of molds growing on groundnuts can produce aflatoxins, which can cause immune-system suppression, gastrointestinal dysfunction, growth retardation, liver disease and cancer. Adopting good agronomic practices (GAP) can help make groundnut production safe and reduce the risk of aflatoxin contamination.

As part of SPRING/Ghana's strategy to promote nutrition-sensitive agriculture practices, the Farmer Field School (FFS) training methodology has been adopted to enhance the understanding and adoption of practices that promote the production and consumption of aflatoxin-safe groundnuts among 1000-day beneficiaries.

This instructional-based training video was developed by SPRING/Ghana as a job aid for agriculture extension agents (AEAs) to engage groundnut farmers in northern Ghana on some selected topics from the FFS training manual.

## Overview of the GAP Training Video

The training video provides instructions in two sections: pre-harvest practices and post-harvest practices. The topics treated under the pre-harvest practices are site selection and land preparation, seed selection, germination test, plant spacing, weed control, fertilizer application, timely harvesting and appropriate harvesting techniques. Topics under the post-harvest practices are drying, storage techniques, and processing and utilization of groundnuts.

The video shows instructions and information in a systematic manner, from cultivation to harvesting for the pre-harvest section, and from drying to processing and utilization for the post-harvest section.

The video was mostly filmed in the Northern and Upper East regions of Ghana, with a few snapshots of best practices from other places. It is 13:30 minutes long.

## The Facilitator

The video must be used by agriculture extension agents (AEAs) who are well versed in recommended agronomic practices in the cultivation of groundnuts. They must also be oriented on the use of audiovisual tools and some basic principles of adult education.

## Instructions for the Facilitator

Before starting the session, please ask the participants to do the following:

- Sit in such a way that everybody can see and hear the video.
- Refrain from actions that can disturb others during the video.

- Hold all questions until the facilitator asks participants to contribute.
- Raise their hands if they wish to speak during discussion time.
- Understand that everyone's opinion matters.

During and after the video:

- Give a brief background and explain the objectives of the activity.
- Play the video and pause at the end of every topic for discussion.
- Use suggested questions (below) as discussion starters.
- Allow as many perspectives as possible to be covered in the discussion.
- Ensure that participants leave with the right information and understanding of key messages, are in a positive frame of mind, and are closer to adopting the recommended practices.
- Note action points for follow-up.

### Questions for Discussion

The discussion questions are divided into two broad sections, with specific topics under each of the main sections. Each section provides guidelines on how to systematically carry out the discussion. Key messages related to the topic are stated for emphasis.

# Section One: Pre-Harvest Practices

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## Topic 1: Site Selection and Land Preparation

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. What type of land do you think is good for groundnut cultivation?
2. Why is site selection critical for groundnut cultivation?
3. How is land prepared for cultivation?
4. Why is it important to pay attention to land preparation?

*Note the answers to the questions above. Play the portion of the video that talks about site selection and land preparation for more information (found at 1:21).*

After watching the video, assist participants in understanding key messages, clarifying uncertainties, and correcting any misinformation they may have stated in their responses. Ask them the following questions:

1. Who has any experience to share about site selection and land preparation?
2. What are the challenges or obstacles that prevent you from practicing the recommended practices?
3. How can you address those obstacles and challenges, especially those related to societal norms, cultural practices, and superstition?

Conclude the session by reiterating how to overcome challenges in site selection and land preparation.

### Facilitator's Notes

<p>Characteristics of good land for groundnut cultivation</p> <p>What is the best soil type and land for the cultivation of groundnuts?</p>	<ul style="list-style-type: none"> <li>• deep</li> <li>• well-drained</li> <li>• loose</li> <li>• light-textured</li> <li>• well-aerated</li> <li>• best soil type is loose sandy-loam/clay loam</li> </ul> <p>These soils improve seed germination and sprouting and allow easy peg penetration and pod formation during later development of the groundnut plant.</p> <p>Groundnuts cannot grow well on rocky, water logged, and sandy fields.</p>
<p>How land is prepared for groundnut cultivation</p>	<ul style="list-style-type: none"> <li>• Remove stumps and clear weeds, but do not burn.</li> <li>• Prepare land using a tractor, animal drawn plough, or a hoe.</li> <li>• Land should be prepared early, at the onset of the rainy season.</li> <li>• Plough fields deeply with fine seed beds to obtain better yield.</li> </ul>

	<ul style="list-style-type: none"> <li>● Plough across slopes to prevent runoff on sloping lands.</li> </ul> <p>The seedbed can be prepared using a manual hoe, bullock traction, or other animal drawn plough. Tractors are effective at turning soil to bury crop residue and weeds, remove stumps, and guarantee proper water penetration and retention.</p>
<p>Importance of good land preparation</p> <p>Why site selection and land preparation is critical</p>	<p>Good land preparation helps achieve maximum water retention, fast and uniform seed germination, and better weed and disease control and management.</p>

## Topic 2: Seed Selection

*Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.*

1. Where or how can you ensure that you get proper seeds for sowing?
2. How is seed selection done?
3. What is the importance or why is it necessary to do seed selection?
4. What are the characteristics of good groundnut seed?

*Note the answers to the questions above and play the portion of the video that talks about seed selection (found at 3:18).*

After watching the video ask participants to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they may have stated in their responses. Ask them the following questions:

1. Share your experiences using seeds after seed selection and using seeds without seed selection (ask two participants to share experiences).
2. What are the challenges or obstacles that prevent you from practicing seed selection?
3. How can these challenges be addressed? (discuss)

Conclude the session by reviewing the seed selection process, as shown in the video.

### Facilitator's Notes

Where or how can proper seed be obtained for planting?	From a certified/registered agro-input dealer.  Preserve unshelled groundnuts to use as seed during the planting season. They should be hand-shelled two weeks before planting to prevent any damage to the seeds.  Hand-shelling of groundnut seed is recommended since physical damage such as breakage and skin peeling is minimized.
How is seed selection done?	After shelling, sort the seeds to remove the shriveled, immature, moldy, skinned and small seeds before sowing
What are the characteristics of good groundnut seeds?	Good seeds should be free of deformities, wrinkles, molds, or cracks.

### Topic 3: Germination Test

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. What is a germination test?
2. Why do we need to conduct a germination test?
3. How is a germination test conducted?

Note the answers to the questions above and play the portion of the video on the germination test (found at 3:57).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Has anybody ever conducted a germination test or seen someone conduct one? What was the outcome?
2. Why don't groundnut farmers conduct germination tests before planting?
3. What do farmers do to the bad groundnuts after sorting?

Conclude the session by reemphasizing how to conduct a germination test.

#### Facilitator's Notes

What is a germination test?	A germination test is an activity carried out to assess the viability of seeds before planting.  It is ideally conducted 8–10 days before planting.
Why do we need to conduct a germination test?	To determine seed viability before sowing. It is done at least a week before planting  It will help you know whether a maximum plant population per planted field will be achieved.
Where and how is a germination test conducted?	The test can be conducted in the backyard garden at home or through a sample of soil collected in a container <ul style="list-style-type: none"><li>• Randomly select 20 or 100 seeds from the seed stock.</li><li>• Evenly place the seeds in a trench 1–2 m long and cover with 3–5 cm of moist soil.</li><li>• Water the seeds to maintain good moisture content and observe for 5–7 days.</li><li>• The number of seeds that sprout after 7 days indicates the viability of the seeds.</li></ul>

	If you count	Then plant....
	At least 17 out of 20 or 85 out of 100	1 seed per hole
	14 out of 20 or 70–84 out of 100 plants	2 seeds per hole
	Less than 14 out of 20 or 70 out of 100 plants	Get better seeds. Your seeds are not suitable and if used, low plant population per cultivated area will be achieved.
	Certified seeds should be obtained from recognized seed dealers at regular intervals, preferably every 2–3 years	

## Topic 4: Plant Spacing

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. When should planting be done?
2. Why is it important to plant groundnuts in rows?
3. How are groundnuts planted in your area?

Note the answers to the questions above and play the portion of the video on plant spacing (found at 5:05).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has any experience to share about plant spacing?
2. What are the challenges or obstacles that prevent you from practicing plant spacing?
3. How can you address those obstacles and challenges?

Conclude the session by reviewing the guidelines on plant spacing.

### Facilitator's Notes

When should planting be done?	Plant as soon as there is adequate and consistent moisture in the soil on prepared beds to ensure good germination.  Take advantage of periods of higher rainfall.
Why is plant spacing important?	Recommended plant spacing is very important in achieving optimum plant population per unit area and obtaining optimum crop yield.
Why is it important to plant groundnuts in rows?	It eases agronomic practices such as weeding, spraying against pests, disease identification and harvesting.
How is planting done?	A hill is a hole in which seeds are sown. For groundnuts, you need to use one seed per hill. <ul style="list-style-type: none"> <li>● Planting can be done with either a cutlass, hoe, dibbler (pointed stick) or manual planter (a labor and time saving device that opens the ground, drops the seed, covers and firms the ground) by making holes and putting the seeds in them.</li> <li>● Plant the seeds in rows using a garden line and pegs.</li> <li>● Plant to a depth of 4–5 cm, cover seed, and firm with your foot or hoe/cutlass.</li> <li>● Leave 30-50cm between rows and 15-20cm between hills or stands in each row</li> </ul>

	depending on the variety
Recommended planting method	Manual planters are also recommended to reduce the workload and save time required during planting.

## Topic 5: Weed Control

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. Why is weed control important?
2. When is weed control done on your groundnut farm?
3. How many times do you have to weed your farm in a crop season and how is it done at each stage?

Note the answers to the questions above and play the portion of the video on weed control (found at 6:53).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has any experience to share about weed control?
2. What are the challenges or obstacles that prevent you from practicing weed control?
3. How can you address the challenges?

Conclude the session by restating why weed control is critical.

### Facilitator's Notes

What is the importance of weed control?	Weeding groundnut farms controls weeds, pests and diseases.
When is weed control done?	<p>Weed at least twice:</p> <ul style="list-style-type: none"> <li>• 1–2 weeks after planting to remove weeds and loosen the soil to support plant growth</li> <li>• 5–6 weeks after planting, before initiation of pegging.</li> </ul> <p>Weeding is done by hand (pulling) or with a hoe.</p> <p>At the advanced stage, especially during pegging, you will need to use your hands to gently pull out weeds that are interspersed with groundnuts. Avoid disturbing the pegging and pod formation.</p>
How many times is weeding done and at what stage?	<p>Control weeds on your farm at the early stages of plant development (3–6 weeks after planting).</p> <p>Remove weeds as early as possible to reduce competition for nutrients, water, and light.</p>
How is weeding done at each stage?	Weeds are removed with a hoe, cutlass, or uprooting by hand

## Topic 6: Fertilizer Application

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. Why do we need to apply fertilizer on our crops?
2. What do we use as fertilizers?
3. What does fertilizer do for the soil?

Note the answers to the questions above and play the portion of the video on fertilizer application (found at 7:48).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who is willing to share his/her experience with chemical fertilizer application?
2. What are the challenges associated with chemical fertilizer application in your community?
3. How can participants address those challenges?

Conclude the session by providing guidance on overcoming challenges with fertilizer application.

### Facilitator's Notes

Why do we need to apply fertilizer on our farms?	To boost plant growth and development
What do we use as fertilizer?	Organic matter, such as animal droppings or prepared compost
What does fertilizer do for soil and crops?	Organic matter enriches the soil and thus reduces the incidence of soil degradation.

## Topic 7: Timely Harvest

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. What is the best time to harvest groundnuts?
2. What are the best signs that the groundnuts are mature and ready for harvest?
3. What happens if groundnuts are harvested prematurely?
4. What happens if groundnuts are harvested late?

Note the answers to the questions above and play the portion of the video on timely harvest (found at 8:08).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has an experience to share about planning the timing their harvest?
2. What are the challenges associated with timely harvest?
3. How can those obstacles and challenges be addressed?

Conclude the session by emphasizing the importance of timely harvesting.

### Facilitator's Notes

<p>What is the best time to harvest groundnuts?</p>	<p>Harvest groundnuts when there are clear indications that they have matured.</p>
<p>What are the best signs that the groundnuts are mature and ready for harvest?</p>	<p>When the vines turn yellow and leaves begin to shed it is often a sign that the pods are mature.</p> <p>However, leaf fall could also be a result of diseases or water stress.</p> <p>If you uproot the groundnuts and count each plant, and between 70–80 percent (7 to 8 out of 10) have dark marking inside the pods, then your groundnut can be harvested.</p> <p>It is therefore important to observe all these signs before harvesting:</p> <ul style="list-style-type: none"> <li>● The leaves are yellowing and begin to shed</li> <li>● The seeds become hard to crack.</li> <li>● The inner portions of pods turn brown.</li> </ul> <p>Pull 3–5 plants and shell and examine the insides of the shells. If the majority (e.g., 7 or 8 out of 10 attached pods) have dark markings inside the shells, harvest the plants.</p>

<p>What happens if groundnuts are harvested prematurely?</p>	<p>Groundnut kernels shrink upon drying. This could result in decreased yield, poor seed quality, and low oil content.</p>
<p>What happens if groundnuts are harvested late?</p>	<p>Non-dormant varieties sprout in the field, resulting in bad looking groundnuts, yield losses, and poor seed quality. This also increases the risk of mold during storage.</p> <p>It is therefore good to know the maturity period of the variety you have planted to serve as a guide to when to harvest your groundnuts.</p>

## Topic 8: Appropriate Harvesting Techniques

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. What are the various techniques of harvesting groundnuts?
2. What do you do if you cannot strip the pods immediately after uprooting the groundnuts?

Note all the answers to the questions above and play the portion of the video on appropriate harvesting techniques (found at 9:41).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has an experience to share about appropriate harvesting techniques?
2. What are the challenges or obstacles that prevent you from using appropriate harvesting techniques?
3. How can you address those obstacles and challenges?

Conclude the session by reviewing the appropriate harvesting techniques.

### Facilitator's Notes

<p>What are the various techniques of harvesting groundnuts?</p>	<p>Hand pulling, digging the plant with a hoe, or using a groundnut lifter:</p> <ul style="list-style-type: none"> <li>• Hand harvesting is done by yanking the plant out of the soil. This is best done when the soil is moist and loose. It is used for erect varieties.</li> <li>• Hoe harvesting is best for spreading varieties and is done carefully to avoid damaging pods or losing some of the nuts.</li> </ul> <p>Be sure to shake off soil after harvesting and expose the nuts to sunlight by turning the crop upside down.</p>
<p>What do you do if the pods cannot be stripped immediately after uprooting the groundnuts?</p>	<p>You have to turn the haulms upside down to expose nuts if the pods cannot be stripped immediately.</p>
	<p>You can strip groundnuts by manual plucking.</p>

## Section Two: Post-Harvest Practices

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### Topic 1: Drying Techniques

*Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.*

1. How are groundnuts dried on the field soon after harvesting before pods are stripped?
2. What are the best ways of drying groundnuts after stripping the pods?
3. How do you determine the dryness of the nuts or how do you know the nuts are well dried?
4. What happens when the groundnut is over dried?

*Note all the answers to the questions above and play the portion of the video on drying techniques (found at 10:09).*

After watching the video, recall the answers provided by participants to confirm their understanding of key messages, clarify uncertainties, and correct misinformation. Ask the following questions:

1. Who has any experience to share about drying groundnuts?
2. What are the challenges or obstacles that prevent you from drying groundnuts appropriately?
3. How can those obstacles and challenges be addressed?

Conclude the session by reviewing the appropriate drying techniques.

## Facilitator's Notes

<p>How are groundnuts dried on the field soon after harvesting before pods are stripped?</p>	<p>Uprooted or lifted plants are staked in the field for a few days to allow them to dry in the sun in an airy place before stripping the pods.</p>
<p>What are the best ways of drying groundnuts after stripping the pods?</p>	<p>Drying is done by leaving the pods under the sun on a tarpaulin for 6–7 days until the moisture content is reduced.</p> <p>Nuts can also be dried on a dry cemented floor, but not on bare wet ground/floor. Protect the nuts from moisture.</p> <ul style="list-style-type: none"> <li>• Groundnuts have to be stripped before drying. Do NOT dry groundnuts on their vines, as this attracts moisture.</li> <li>• It is best to dry on tarpaulins if available. Drying can also be done on cemented floors.</li> <li>• Spread nuts evenly on drying surface and make sure to turn regularly to ensure even drying.</li> <li>• Use a rake or other long pole to turn groundnuts to avoid stepping on and crushing nuts.</li> <li>• Dry groundnuts for 6–7 days before storage.</li> <li>• Do not dry groundnuts by the roadside. This exposes the nuts to vehicles and pedestrians who can step on them. It also endangers drivers and farmers.</li> </ul>
<p>How do you determine the dryness of the nuts or how do you know the nuts are well dried?</p>	<p>You can determine the dryness of the nuts by shaking a handful and listening for a rattling sound.</p> <p>Also, shell and bite on a few. If they stick to your teeth then they are not properly dried.</p>
<p>What happens when the groundnuts are over dried?</p>	<p>Over drying pods can affect kernel quality and seed germination.</p>

## Topic 2: Storage Techniques

Please ask a few questions before showing the video to ascertain the knowledge and experiences of the participants on the topic under discussion.

1. What is the best form of storage for groundnuts?
2. What is the best way to place the groundnuts in the storage facility?

Note all the answers to the questions above and play the portion of the video on storage techniques (found at 11:09).

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has an experience to share about proper or improper groundnut storage?
2. What prevents farmers from storing groundnuts properly?
3. What should we do to ensure that we use appropriate storage techniques for groundnuts?

Conclude the session by providing more information on appropriate storage techniques.

### Facilitator's Notes

What is the best form of storage for groundnuts?	You can store groundnuts either shelled or unshelled  The best way for you to store dried unshelled groundnuts is in sacks, clay/mud silos, woven straw baskets, or clay pots.
What is the best way to place the groundnuts in the storage facility.	All groundnut storage should be raised above the ground to prevent the produce from absorbing moisture. <ul style="list-style-type: none"> <li>• Keep bagged groundnuts on pallets to protect them from moisture.</li> <li>• Keep bags away from the wall to ensure there is adequate air circulation.</li> <li>• Ensure storage rooms are well protected from rodents and other pests.</li> </ul>
Effect of stored groundnut that are not well dried	Storing groundnuts that have been dried improperly will lead to contamination. Ensure nuts are properly dried before storage.
Benefits of good storage practices.	Good storage practices ensure longer life for your groundnuts, and reduced contamination.

### Topic 3: Processing Groundnuts

1. How do you prevent contamination when processing and utilizing groundnuts?
2. How are groundnuts processed?
3. How are groundnuts used to enrich children’s diets?

*Note the answers to the questions above and play the portion of the video on processing and utilizing groundnuts (found at 11:33).*

After watching the video, ask participants the questions above to confirm their understanding of key messages, clarify uncertainties, and correct any misinformation they stated earlier. Ask the following questions:

1. Who has an experience to share about processing and utilizing groundnuts?
2. What should we do to ensure that groundnuts are not contaminated during processing?

Conclude the session by reemphasizing the need to use groundnut-based meals to enrich children’s diets.

### Facilitator’s Notes

<p>How do you reduce contamination during groundnut processing?</p>	<p>Ensure good hygiene and sanitation during processing.</p> <p>Practice proper hygiene and sanitation through handwashing with soap to reduce contamination during food preparation.</p> <p>Use clean utensils and containers to store groundnut paste and oil.</p>
<p>What forms can groundnuts be processed into?</p>	<p>After roasting, groundnuts are skinned and cleaned to remove unwanted particles. They are then milled into paste. Groundnut oil can be extracted from the paste.</p>
<p>How are groundnuts used to enrich children’s diets?</p>	<p>Mix groundnut paste and oil with children’s food, such as porridge, to help enrich their diets and provide energy and protein for children under 2 years of age.</p>
	<p>Aflatoxin-safe groundnuts attract good prices. Therefore, these recommended practices can both improve your income and ensure safe and nutritious food for the family.</p>



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