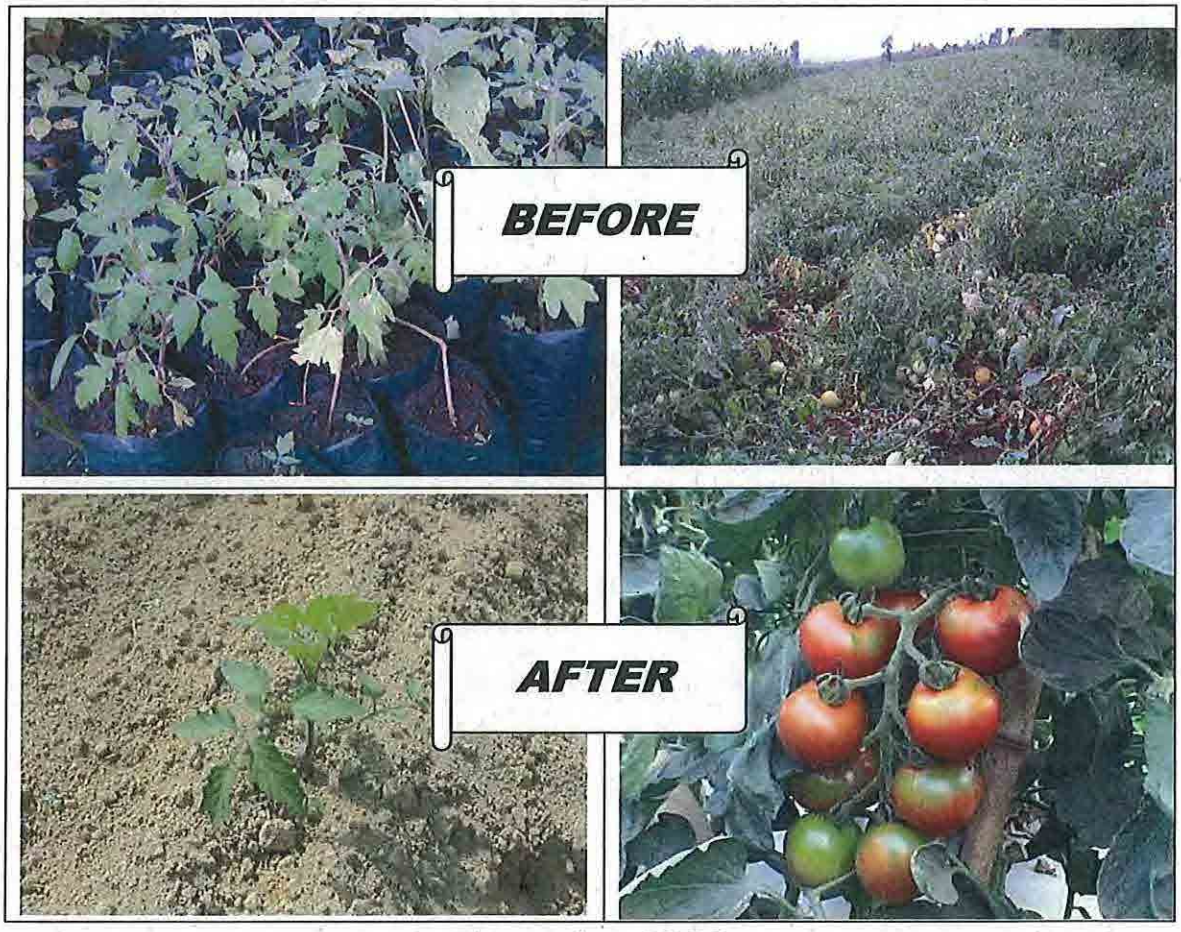
Demonstration Manual on Vegetable Growing

Volume 1 of 3

How to make a nursery

“It’s a matter of seedlings.”



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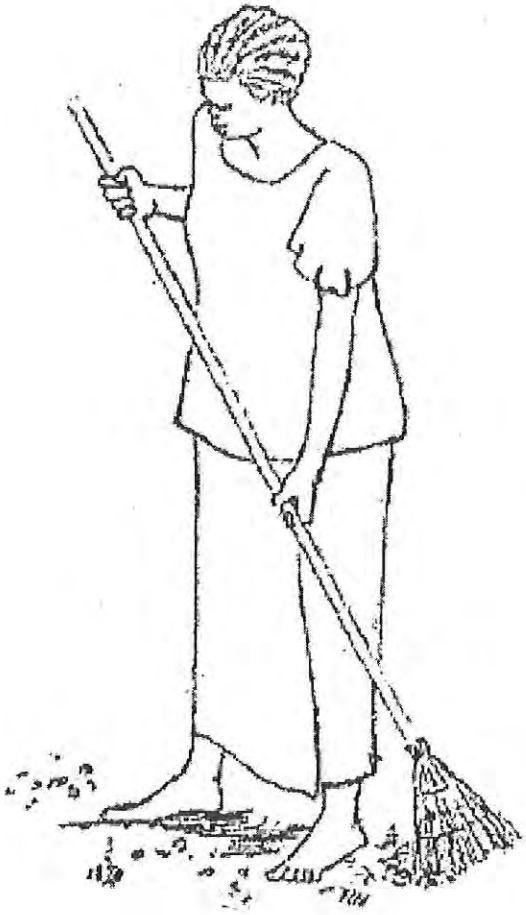
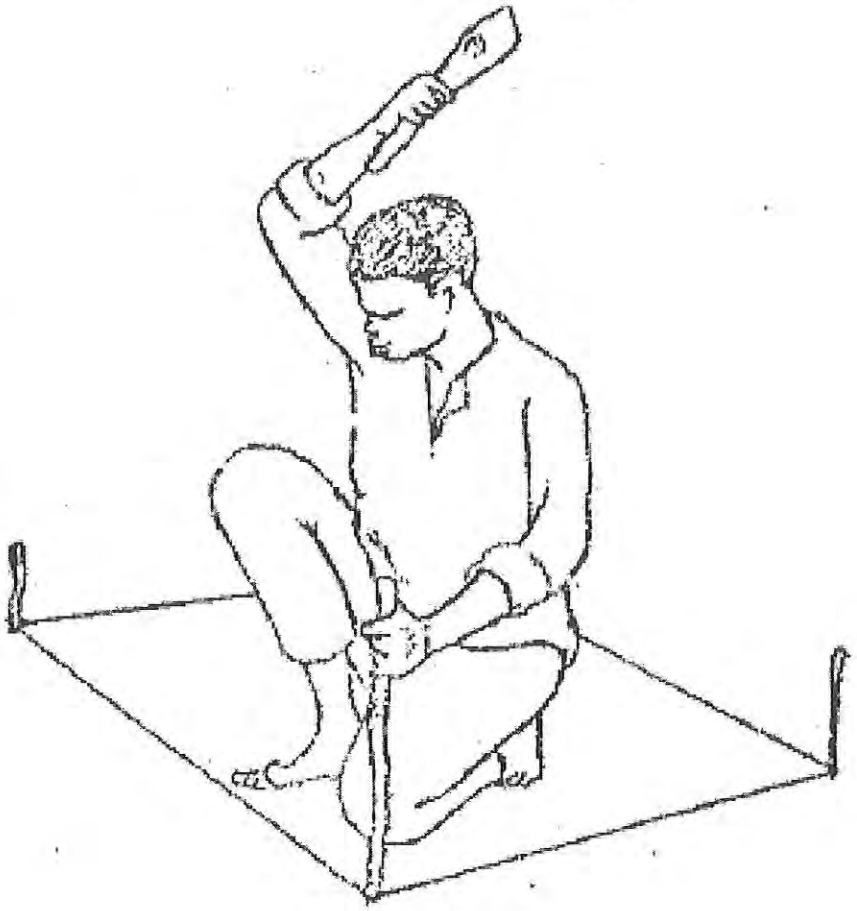
for Sustainable Peace and Development



Clean the piece of land, about 5m x 6m, for nursery where you grow the seedlings of vegetables.

Remove stones and weeds.



Delimit an appropriate space for nursery plot with marking (if available):

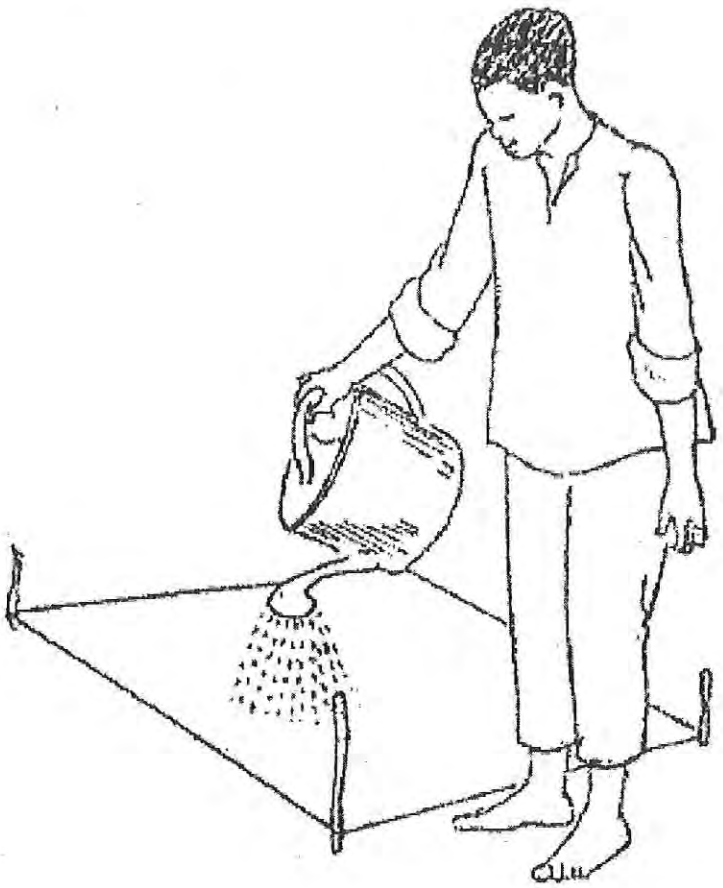
e.g.

1m x 2m for tomato, chili or eggplant;

1m x 3m for onion; and

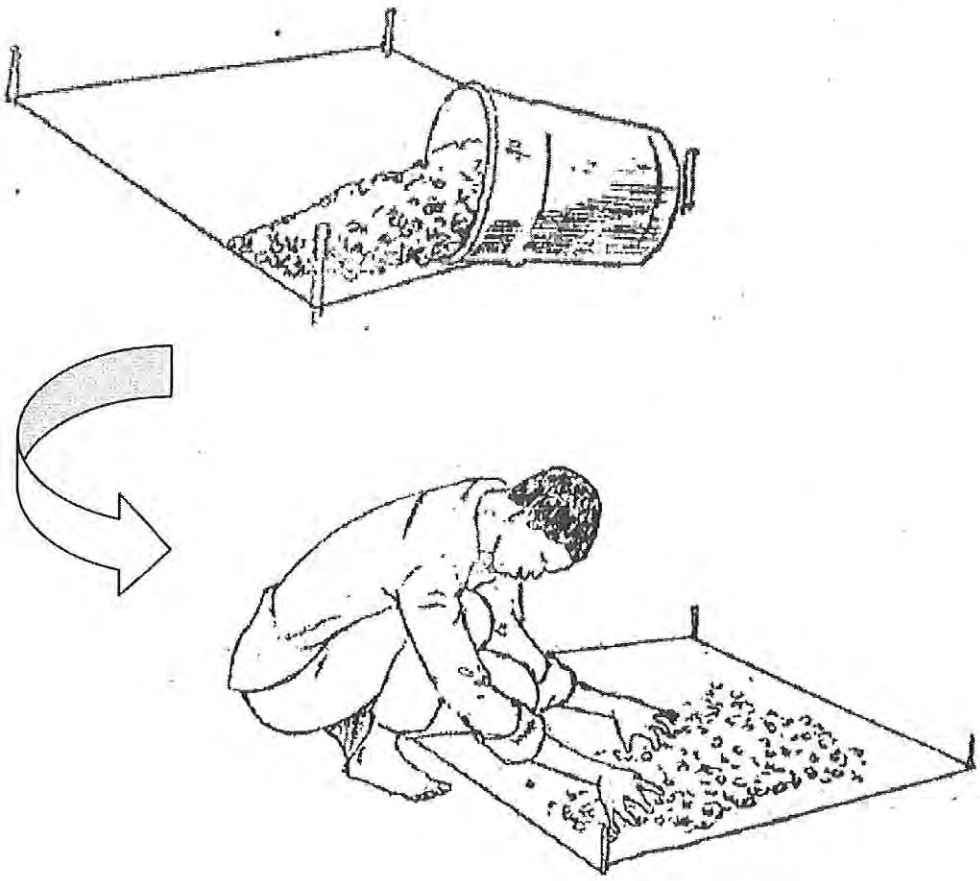
1m x 2.5m for cabbage.

(The figures above are recommendable for a proper care with one adult labor.)



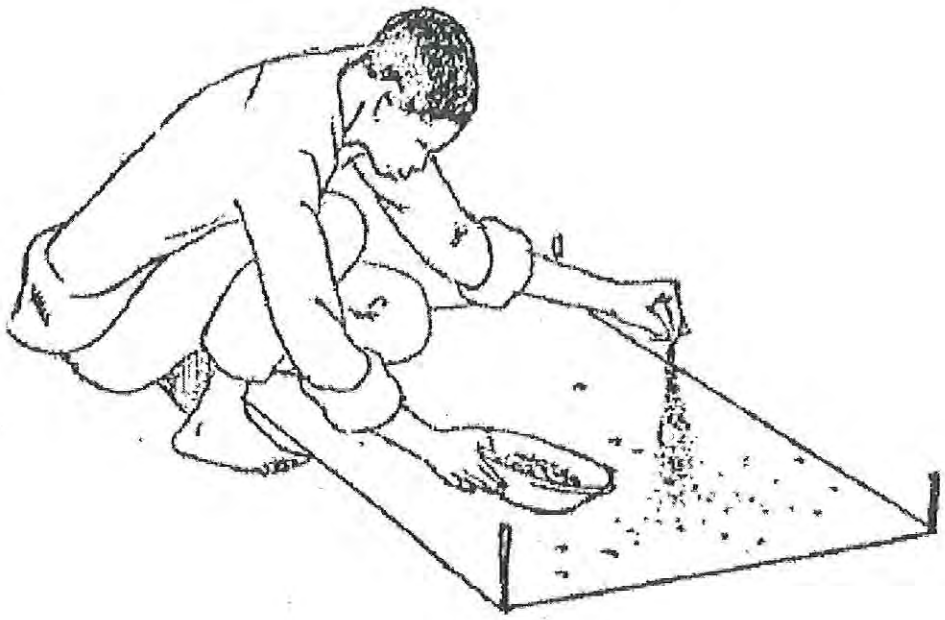
Soak well the nursery plot:

About 2 watering cans of water (15-20 liters) required for m^2.



Apply one bucket (about 7-10 liters) of compost or organic manure (e.g. dry cow dung) for m^2, <u>if available</u>.

Cover all the surface of plot.

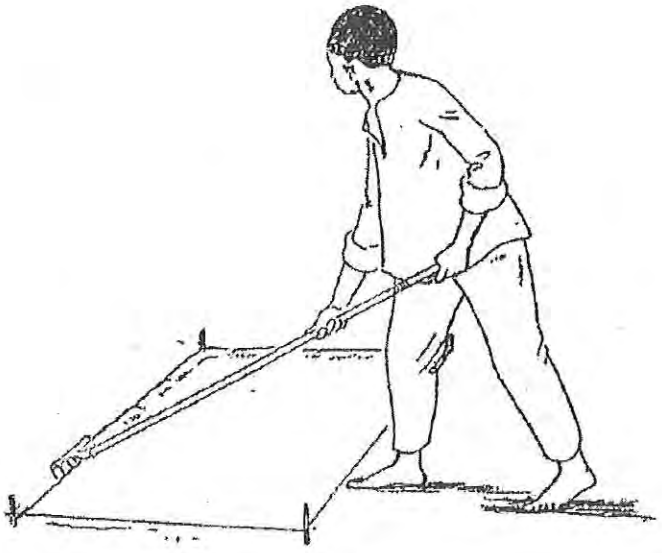


Apply 5 handful of ash or charcoal and 2 handful of chemical fertilizer for each m^2, if available.

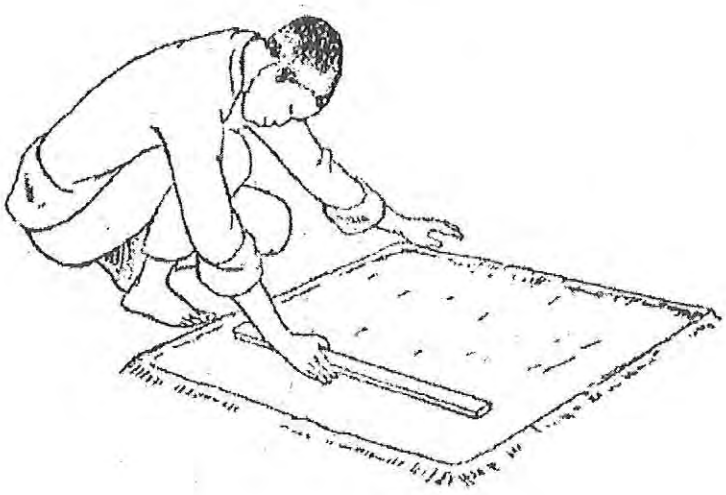
(e.g. DAP or other composed fertilizers are good for tomato, chili, eggplant; urea is especially good for leafy vegetables such as cabbage, or even good for other vegetables)

Plough the plot about 15-20cm of depth and mix well with all the inputs you applied (e.g. compost, manure, ash and chemical fertilizers).

Level the surface of plot, using a tool like rake (if available).

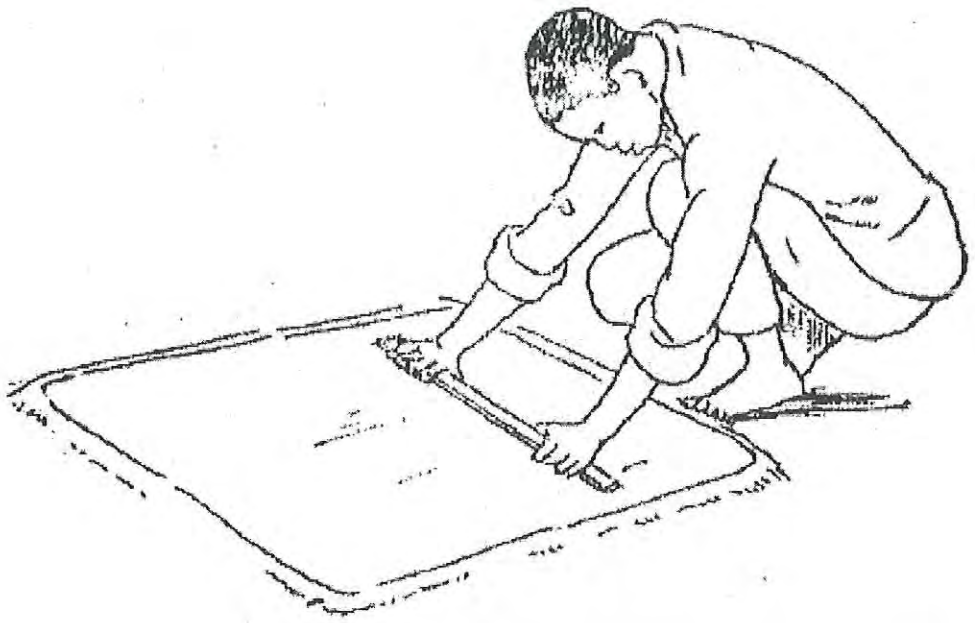


Make bank along the edge of plot with about 10 cm of height.

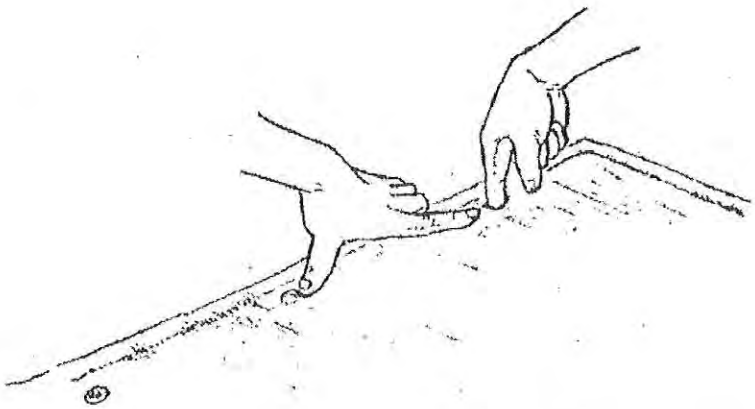


Level properly the surface of plot.

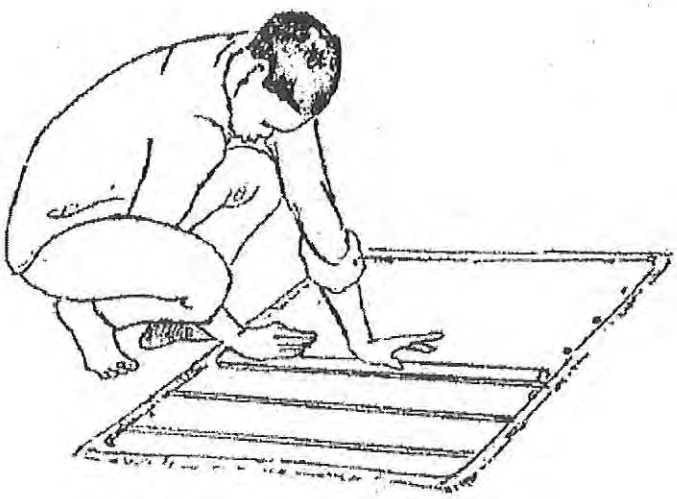
Soak well the plot with 2 watering cans of water for m^2, and wait more than 1hour until you sow seeds.



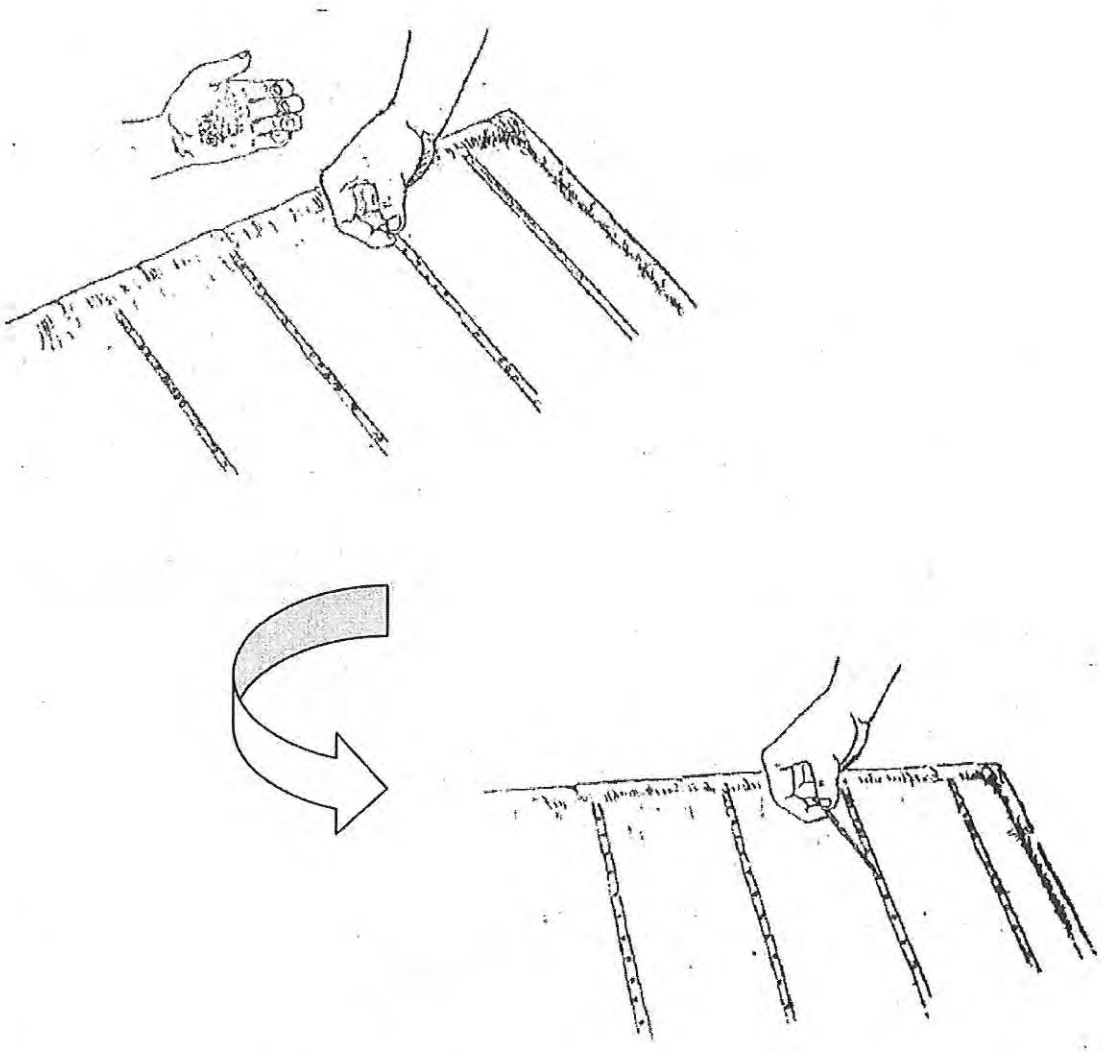
Level again the surface of plot, before sowing seeds, to make sure that the plot is well horizontal.



Mark the points on two sides of the plot with your fingers or a ruler to make appropriate intervals (about 10cm of each, or a half span) between the lines for sowing seeds.



Make (or draw) lines from the points on one side to those on the opposite side with 1cm of depth, using a straight wooden block or a ruler.

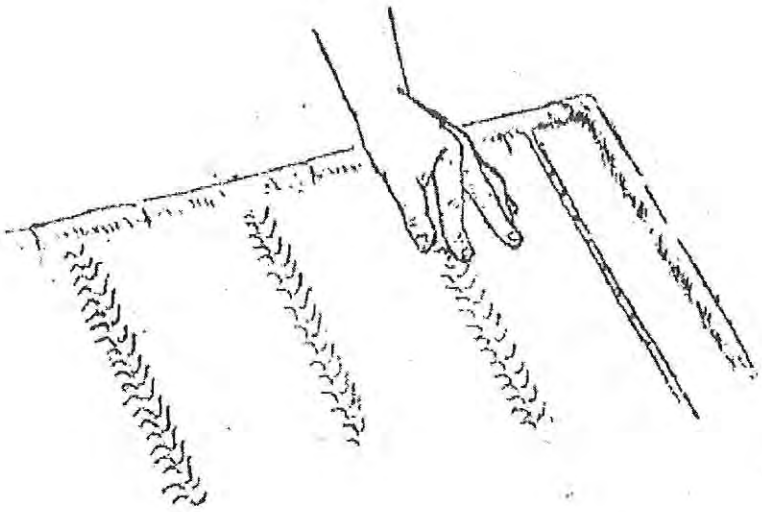


Sow seeds in the lines <u>with adequate intervals between seeds</u>:

4 cm for tomato, chili and eggplant (1g of seeds required for m^2 with this interval);

1 cm for onion (6g for m^2); and

2 cm for cabbage (8g for m^2).



Cover the top of lines with soil, using fingers.

Tap and smooth the surface lightly with your palms.

Cover the plot with dry grass (e.g. roofing grass, stems of sorghum or maize).

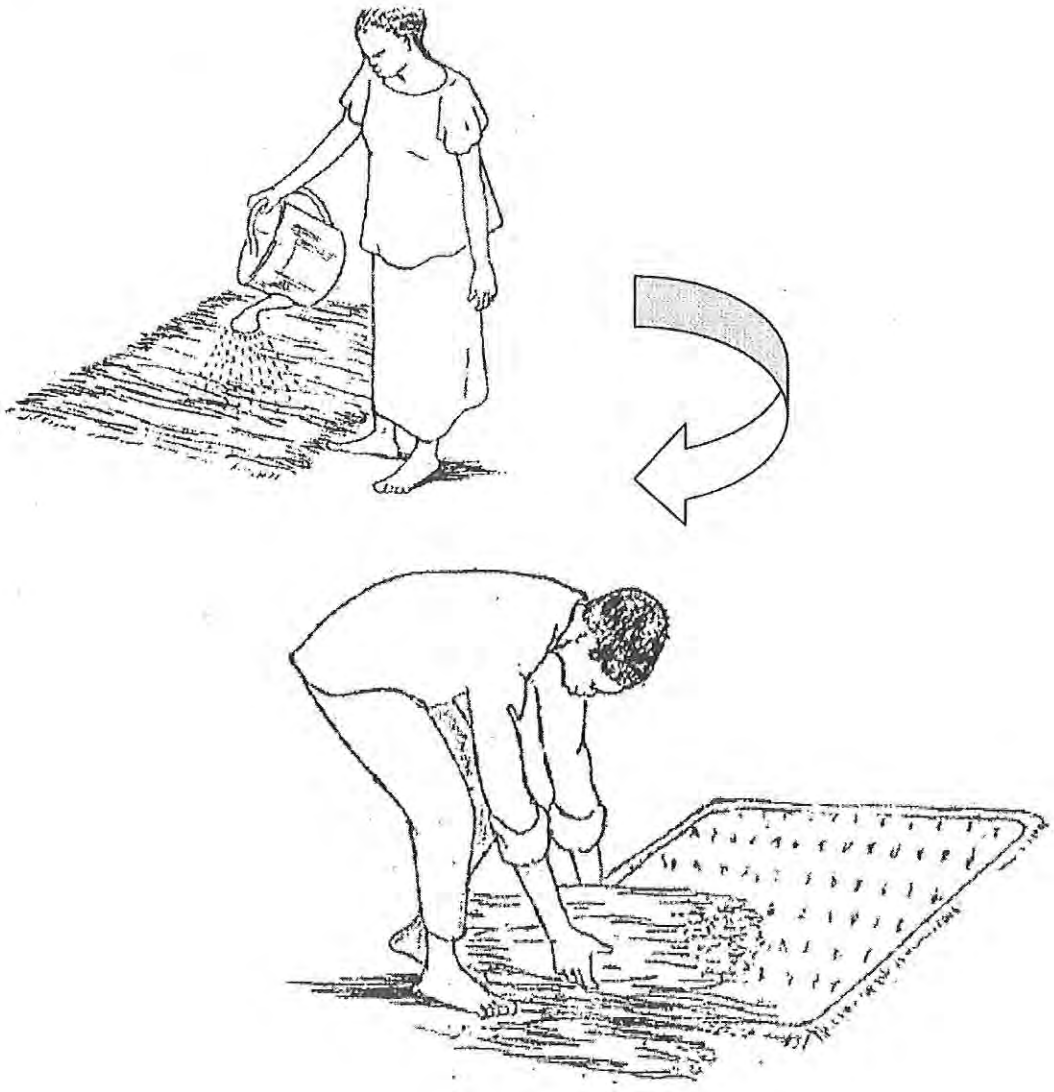
(Attention: Use the grass for covering only after you remove panicles or combs. Otherwise, they start to germinate and compete with your vegetables!)

Give 1 watering can of water (for m^2) immediately after you cover the plot.

Water twice a day until germination: a half watering can (4-5 litters) of water for m^2 every morning and evening.

Check everyday whether the germination starts or not.

Remove the cover <u>immediately when you see the sign of germination (rising shoots of plants)</u>.



Water once a day with a half of watering can (4-5 litters) for m^2 until transplanting. Use liquid fertilizer (1 teaspoon of urea with 1 watering can) once a week to accelerate the growth. Remove weeds regularly.

Scratch the surface of plot (in-between the lines, 2-3cm of depth) with hands or a hoe once a week to let the seedlings grow well. (Attention: Avoid damaging the seedlings.)

Keep an adequate density of seedlings (adequate intervals between seedlings) within the plot:

4 cm x 10cm for tomate, chili, and eggplant;

1 cm x 10cm for onion; and

2 cm x 10 cm for cabbage.

REMEMBER: About 2 weeks after germination is the timing to transplant.

Do not use old seedlings, more than one month old, that will lead only to little or no harvest.

	**NO GOOD.** Too high density results in weak and poor quality of seedlings. **Poor seedlings, poor harvest.**
	**OK!** Adequate intervals produce healthy seedlings. **Better quality seedlings promise you a better harvest!**

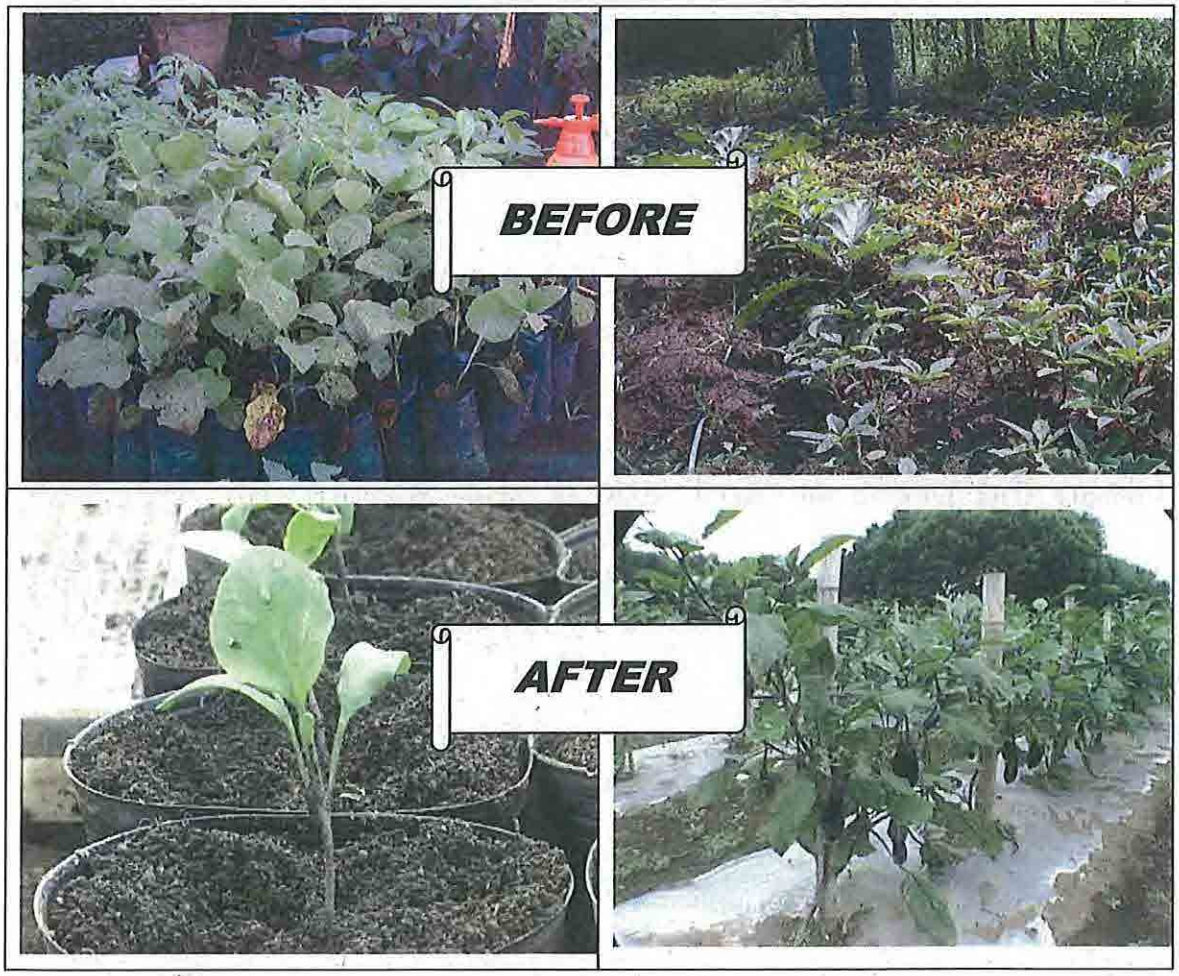
Demonstration Manual on

Vegetable Growing

Volume 2 of 3

How to transplant seedlings

"It's a matter of spacing."



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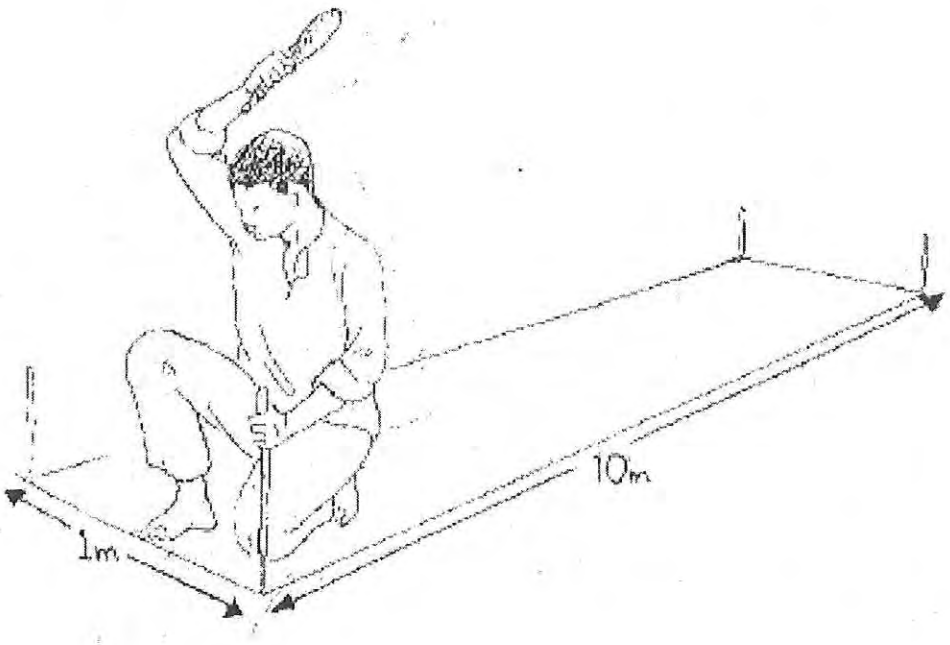
Clean the piece of land, about 10m x 15m, for the plots where you transplant vegetable seedlings and grow until harvest.

Remove stones and weeds.



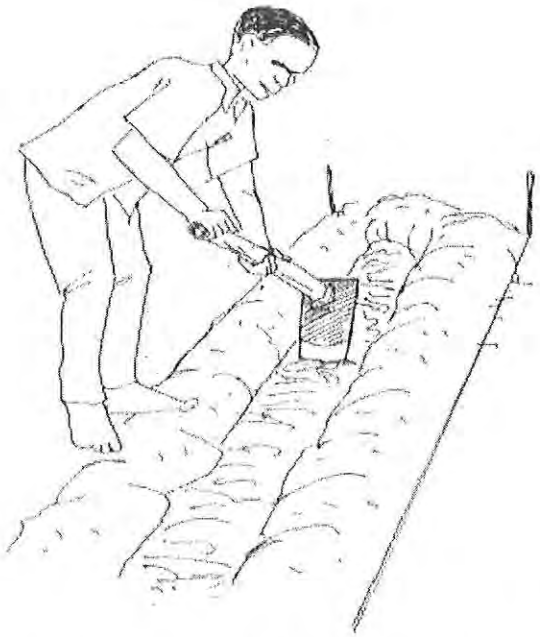
Delimit an appropriate space of 1m x 10m for one transplanting plot.

(The figures above are recommendable for a proper care with one adult labor.)

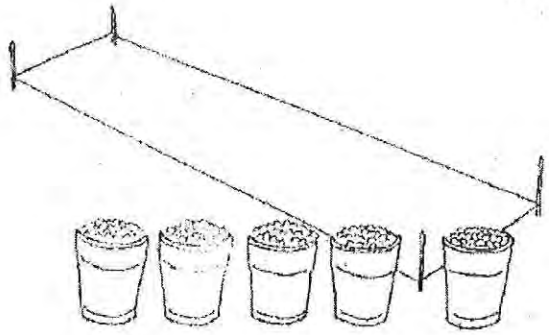
Soak well the nursery plot:

About 2 watering cans of water (15-20 liters) required for m^2.

Plough the plot with either a spade or a shovel about 25 - 30cm of depth.



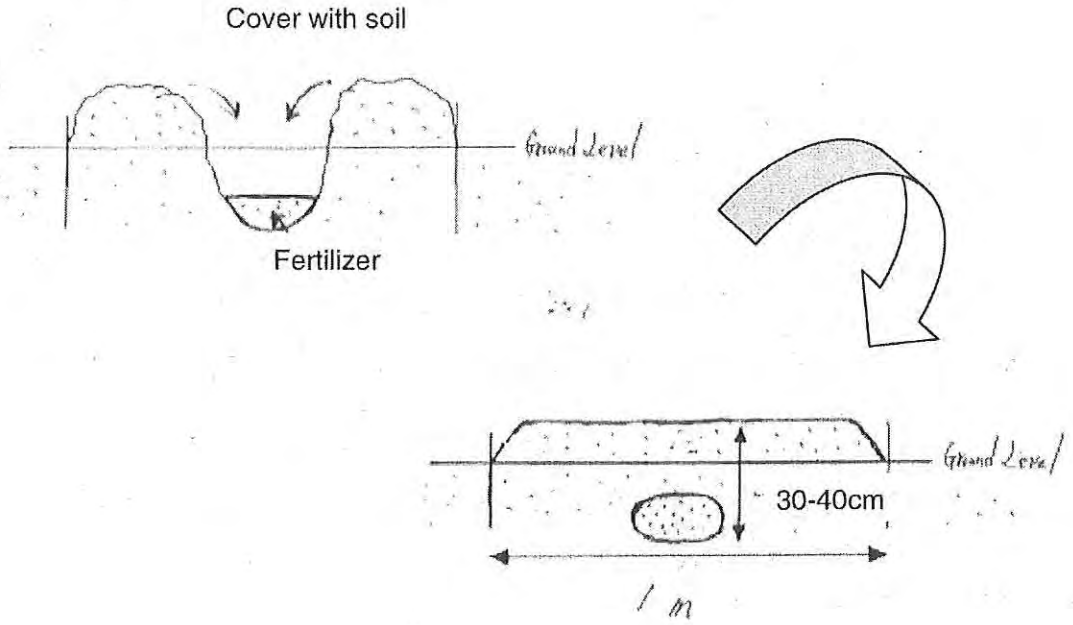
Make a trench in the middle of plot to apply fertilizer, compost or other organic manures, ash or charcoal.

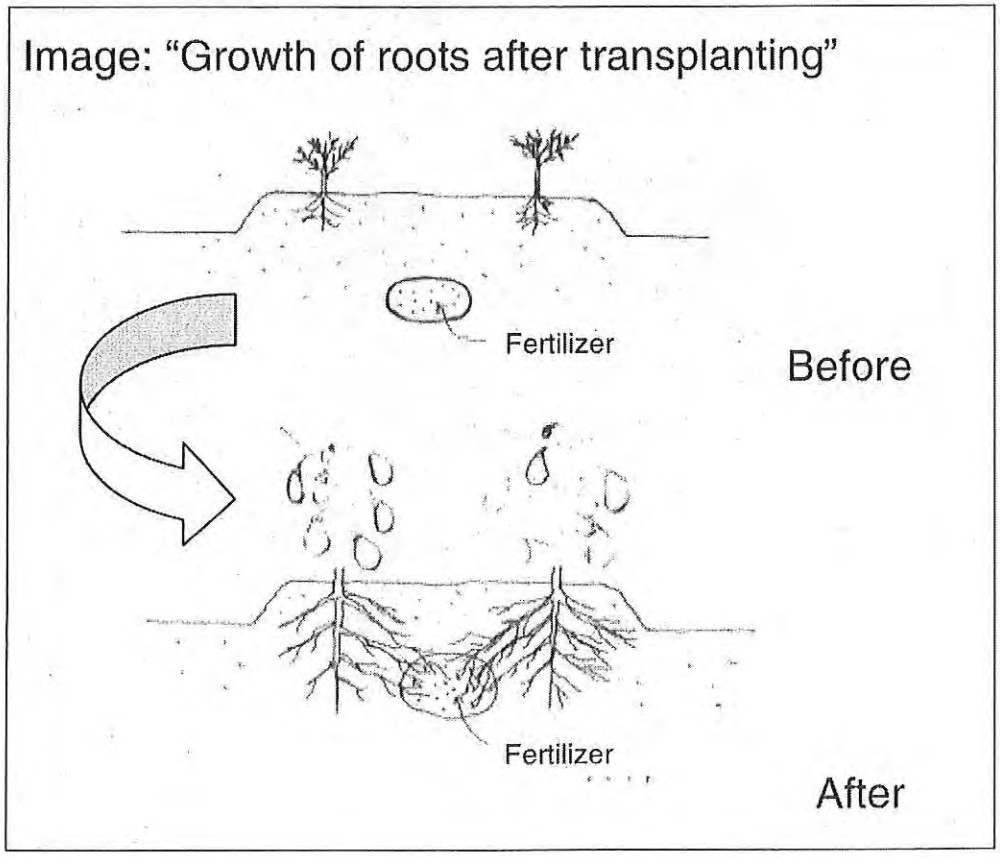


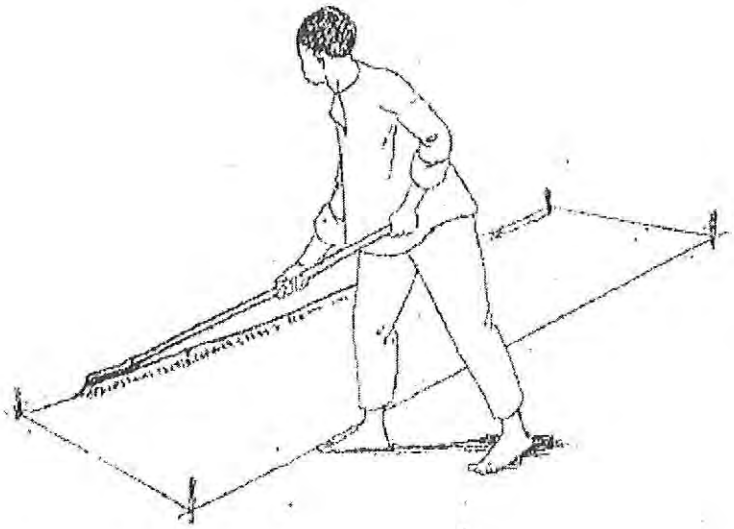
Prepare 300g of chemical fertilizer (e.g. DAP, urea), 4 buckets (about 7-10 liters) of compost or organic manure (e.g. cow/ goat/ donkey/ chicken dung) and a half bucket of ash (or crushed charcoal) for one transplanting plot, <u>if available</u>. Apply them along the trench.

Or, you may apply even small quantity in case of shortage: e.g.
You make small holes of 15cm depth in-between plants, apply 1/2 - 1 teaspoonful of chemical fertilizer and 1-2 handful of organic materials to each hole, and cover the top.
(Apply anything available as much as possible.)

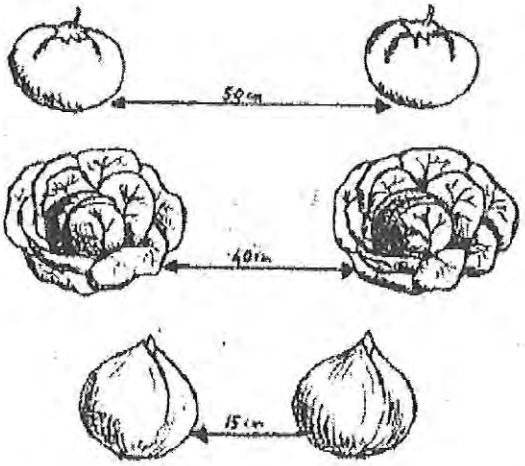
Cover the trench and make a flat mound.







Level the surface of plot with a rake or a flat and straight wooden block.



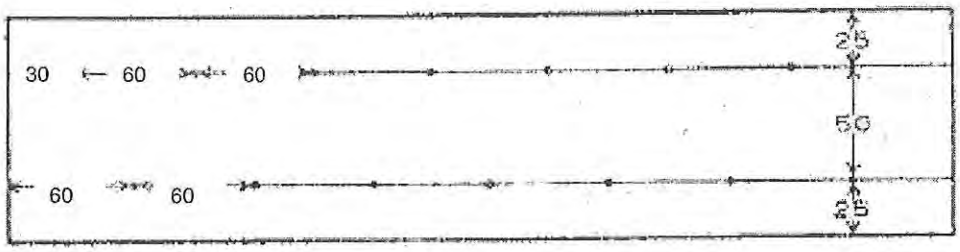
Adequate interval between two plants when transplant:

60cm for tomato, eggplant, chili;

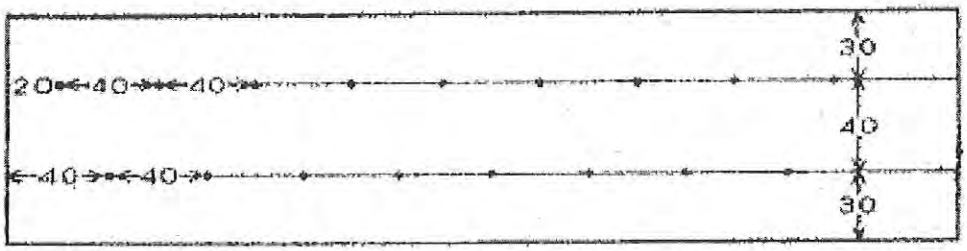
40cm for cabbage; and

15cm for onion.

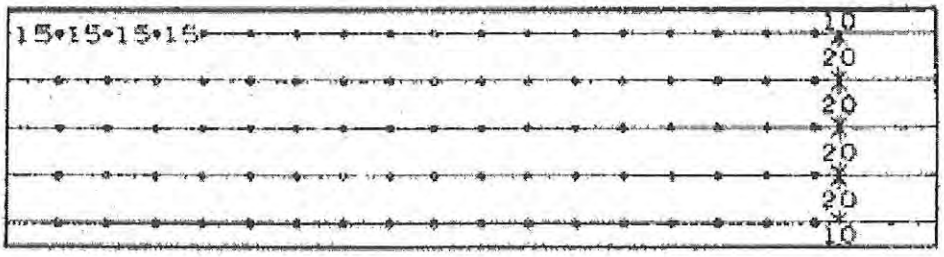
Adequate spacing



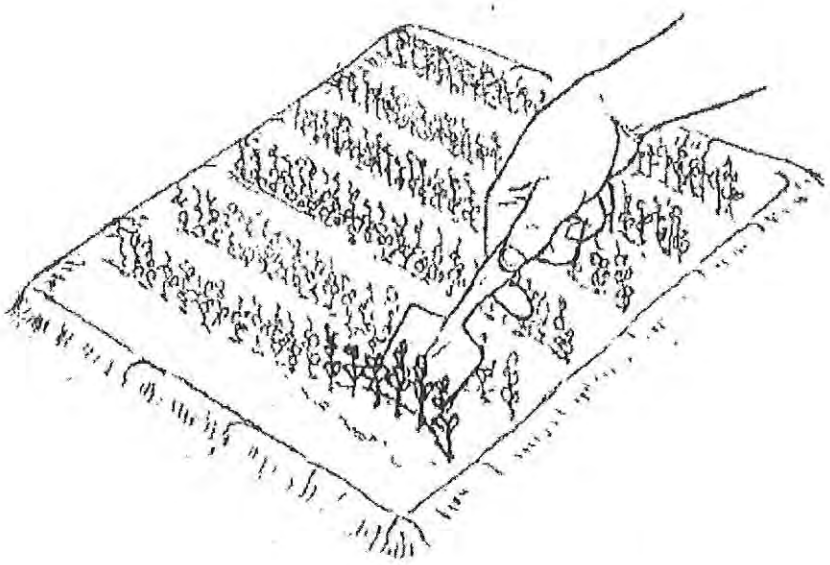
Tomato, eggplant and chili: about 35 plants (seedlings) per one plot of 1m x 10m



Cabbage: 50 plants (seedlings) per one plot

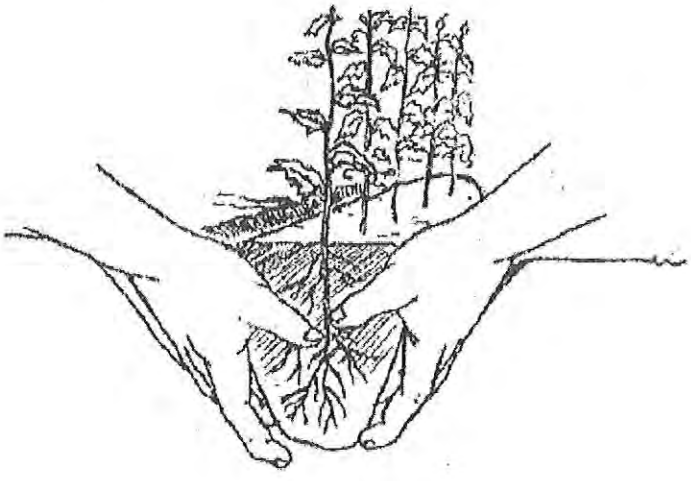


Onion: 325 plants (seedlings) per one plot

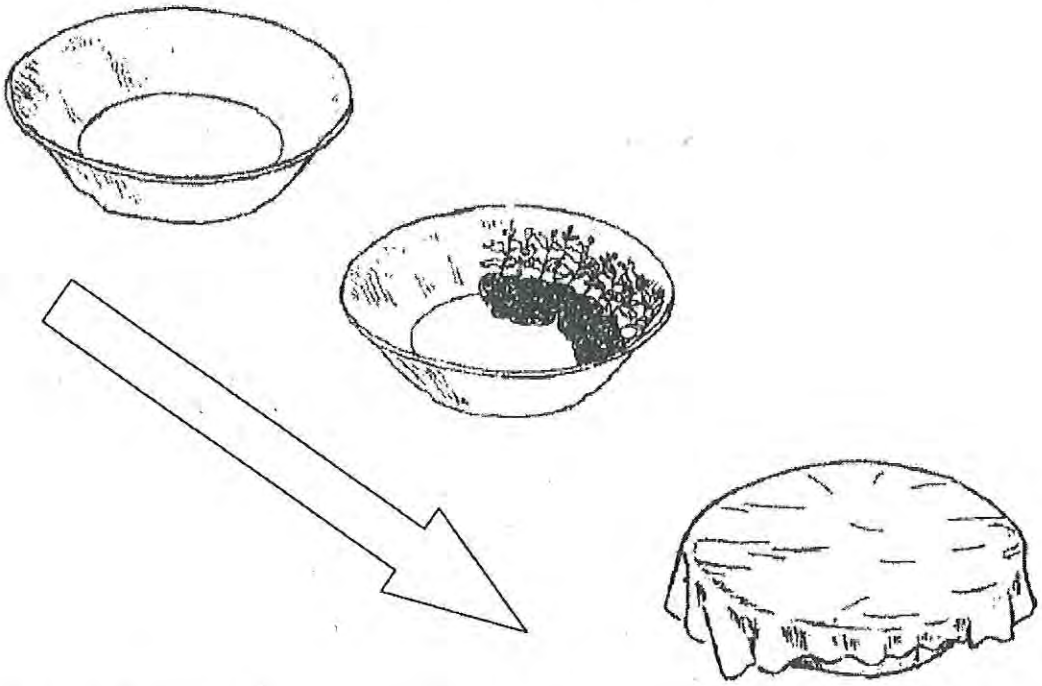


Water the nursery well 2 hours before transplanting*: 2 watering cans for each m^2.

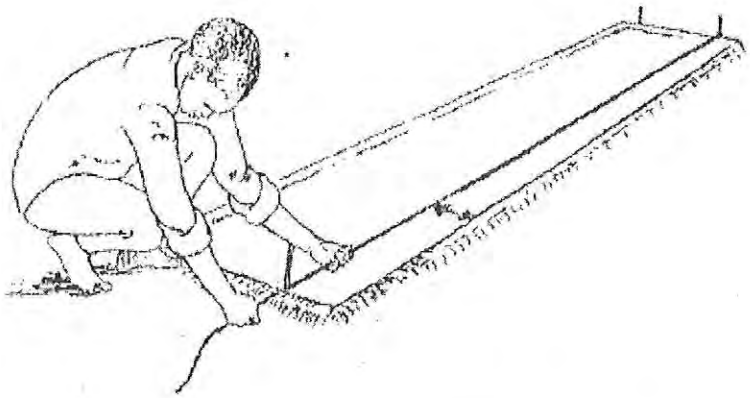
*Do not remove seedlings if they are still wet. Otherwise, they are likely to have mechanical damage. This damage may provoke the infection of diseases.



Remove seedlings with soil block around roots. Handle them carefully one by one not to break the soil block.

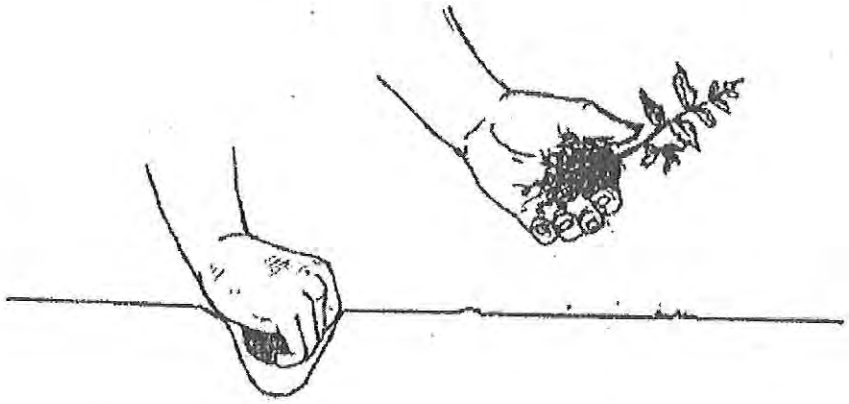


Place the seedlings carefully one by one in a container such as a small basin, and cover the top with wet paper or cloth to keep the moisture of soil block.



Draw lines for transplantation.

Transplant seedlings along the lines as you keep the adequate intervals between plants that are indicated above.



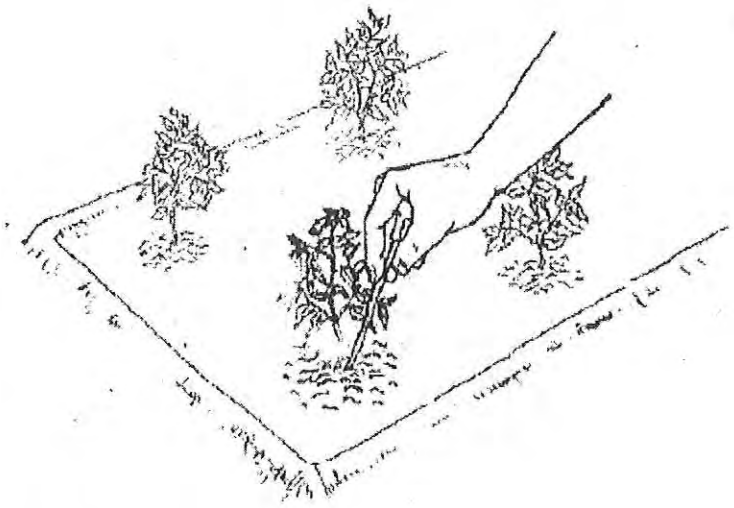
Transplant them one by one carefully enough not to break the soil block.

Press lightly the surface around the plants (transplanted seedlings) using your palms.

Water as soon as possible when you finish transplanting all the seedlings onto the plot: 1 watering can for each m^2.

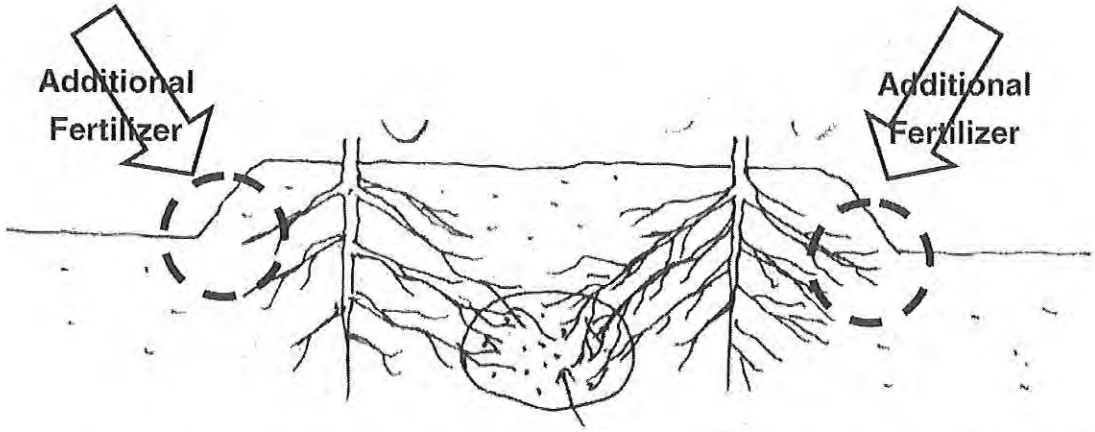
Water daily: 1 watering can for 2 m^2 for the first 2 weeks, then gradually reduce the quantity as long as they look healthy.

Apply liquid fertilizer (one tablespoon of Urea or DAP diluted with 1 watering can of water) if the plants look weak or yellowy: 2 watering cans for 1 plot of 10m^2 after regular watering. The growth can be recovered. Frequency should be no more than once a week.



Weed and scratch the surface around the plants regularly at least once a week.

Cover the surface around the plants from 2 weeks after transplantation to keep soil moisture and also to avoid the mechanical damage due to watering or rainfall.



In order to have a better harvest, apply additional fertilizer, if available, along both long edges of the plot and cover with soil:

200g of DAP/ 10m² plot/ time mixed with compost or organic manure for tomato, eggplant, chili:

2 weeks, 1 month and 2 months after transplanting (totally 3 times).

100 – 200g of Urea or DAP/ plot/ time mixed with compost or organic manure for cabbage:

3 weeks after transplanting (1 time).

Same for onion:

3 weeks and 6 weeks after transplanting (2 times).

Demonstration Manual on

Vegetable Growing

Volume 3 of 3

How to make compost

"It's a matter of soil fertility"

November 2008

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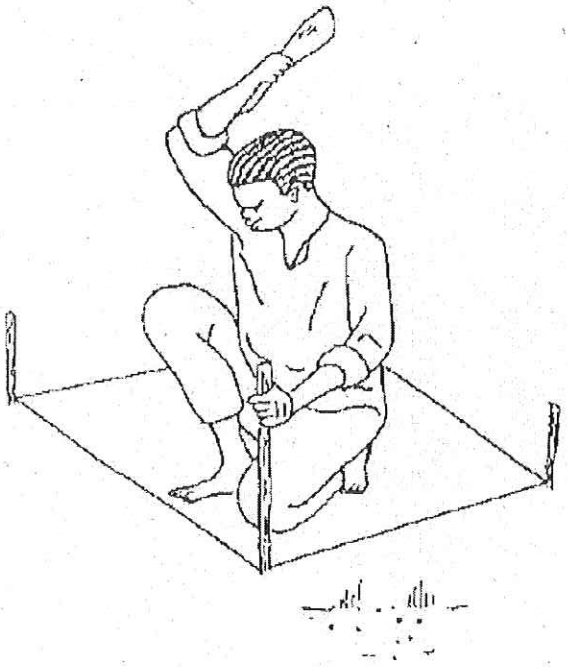
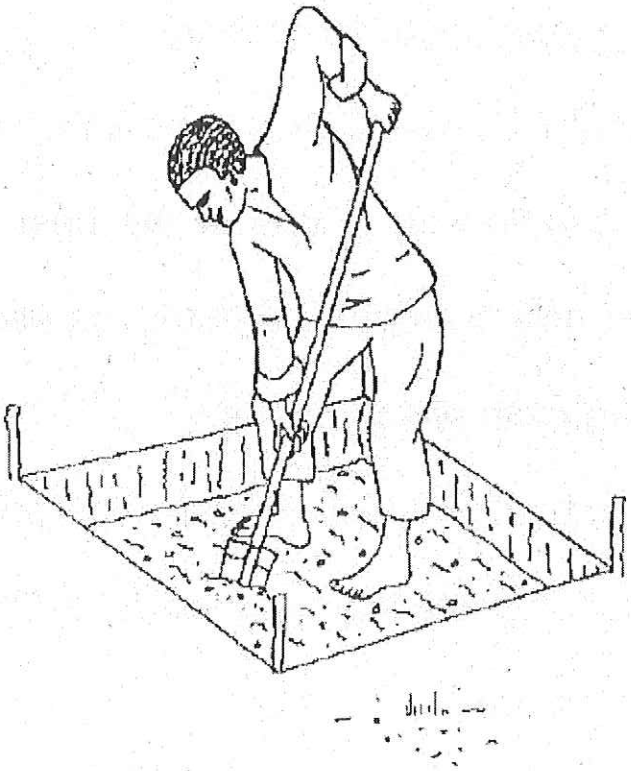
Have a space of 1.5 m x 1.5 m for compost-making on a corner of your farming plot.

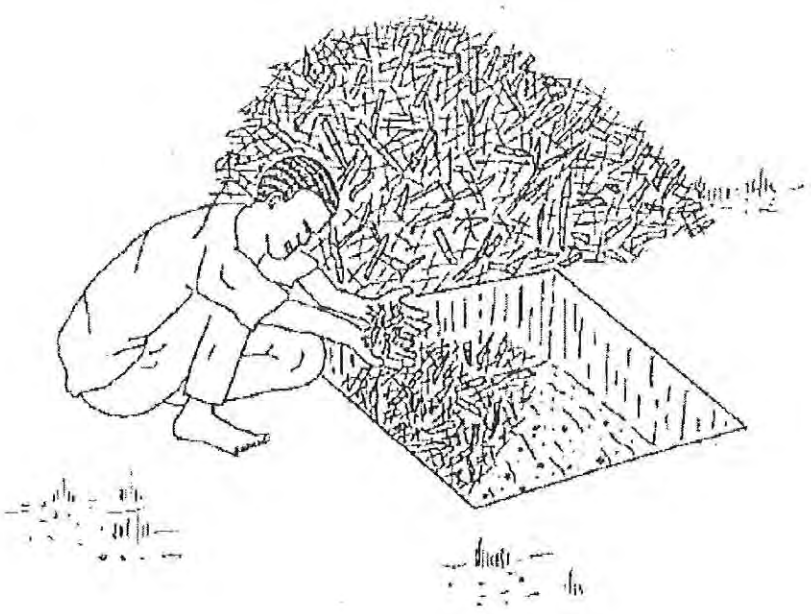
Clean up the surface of the space.



Delimit the space of compost-making.



Dig a square hole with the depth of 30 – 50 cm.



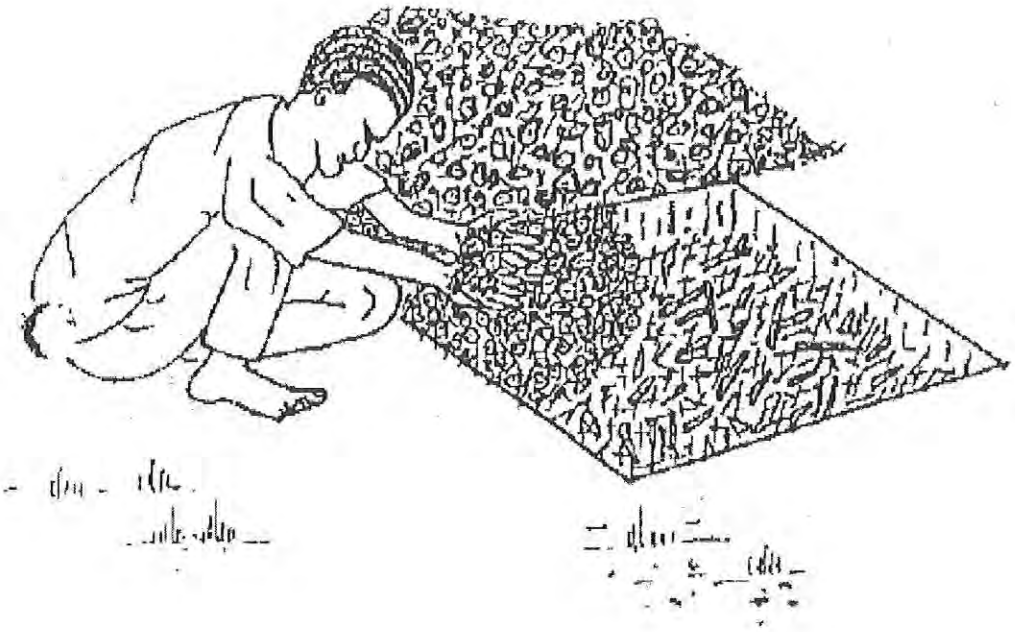
Place a layer (Layer A. See the image on P.) of either dry or green grass* about 10 cm thick.

Remnant (i.e. plants after harvest) of legumes (e.g. beans, peas, groundnuts) is one of the best materials since they contain rich "Nitrogen", a nutritious element most essential for the growth of your crops.

*Remember: Any kind of grass can be utilized. Reduce the quantity of water that is indicated on the manual when you use green grass.

Never use the remnant of vegetable crops that are infected by some disease nor that of striga weed.

Squatter a handful of "Urea" (a chemical fertilizer that contains nitrogen to accelerate the decomposition of materials. Urea is white color and granular.) over the first layer of dry grass, if available.

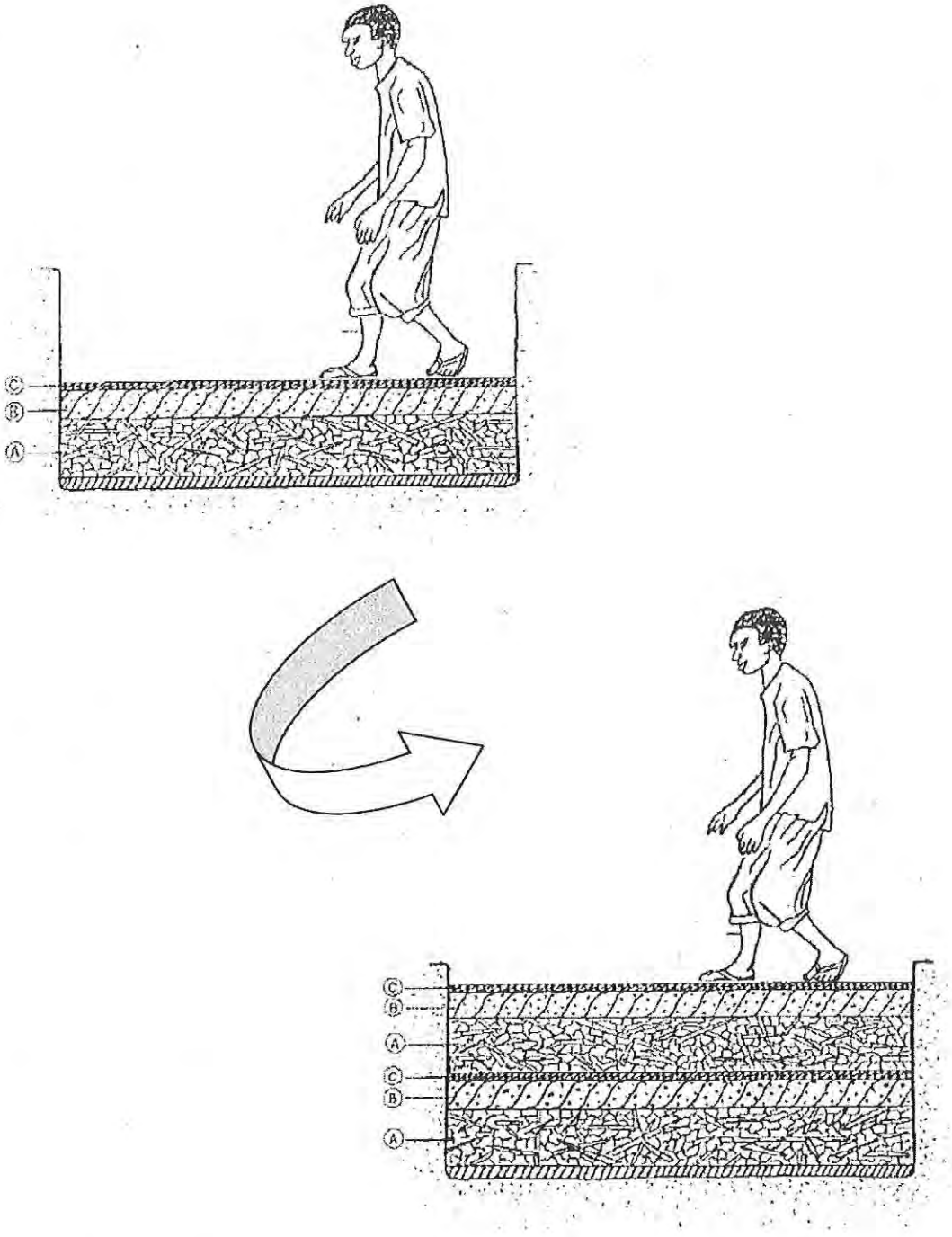


Place a layer (Layer B) of animal dung (e.g. cow, goat/ sheep, chicken) about 3 – 5cm thick, if available. Use the material that is not fresh but dry.

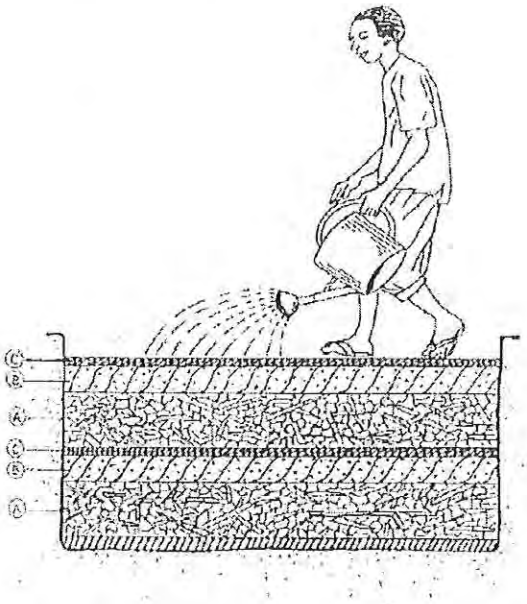
Or, you place another layer of grass about 10 cm thick with a handful of urea.

Place a fine layer of soil about 3 cm thick (Layer C).

Soil contains a number of aerobic and anaerobic micro-organisms that decompose all the materials into useful manure ("compost") to improve the soil fertility.



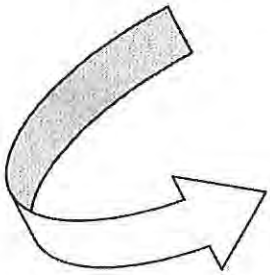
Compact well the surface with your feet to reduce the bulk of materials and to accelerate decomposition after you place a set of layers (Layer A+B+C).



Soak well the materials with 12 – 15 watering cans of water (this quantity required if you use dry materials under the dry condition of climate.) for 2 sets of layers (See the above image).

Cover either with dry grass or with soil to maintain the moisture. ("Decomposition" process: the temperature inside will become very high and cool down about 3 weeks after loading the materials.)

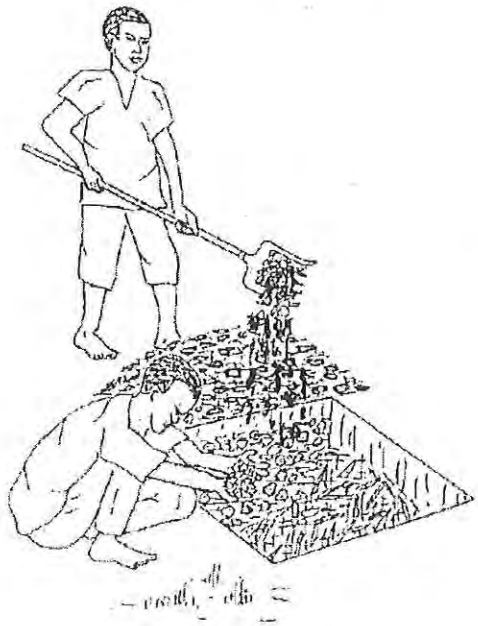
(3 weeks after the loading of materials)



Turn over the materials, which are expected to be half decomposed, beside the hole and return them.

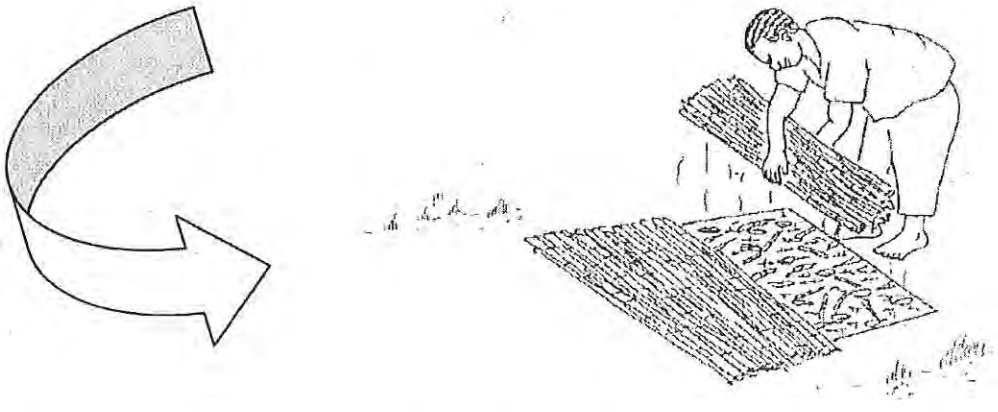
Compact the surface and add 5 cans of water to re-accelerate decomposition. (1st turn-over)

(Another 3 weeks after the 1st turn-over)



Turn over the materials again and add moisture (5 cans of water). (2nd turn-over)

(Another 3 weeks after 2nd turn-over)



The compost (i.e. the organic materials well decomposed) is ready to be applied for your farming plot.