



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



INTEGRATED SOIL FERTILITY MANAGEMENT

PART ONE

RICE - PLANNING AND NURSERY MANAGEMENT



USAID
FROM THE AMERICAN PEOPLE



ACKNOWLEDGEMENT

I would like to express my gratitude to the many people who provided support in developing the **training manual for cauliflower** of the Feed the Future's Nepal Seed and Fertilizer (NSAF) Project which was made possible with the support of the United States Agency for International Development (USAID). I am extremely thankful to the International Fertilizer Development Center team: Dr. Yam Gaihre (Soil Scientist), Ramananda Gupta (Agronomist and Extension Specialist) and Shiva Adhikari (Training and Extension Associate) for their overall leadership and enthusiastic support in content development, planning and execution of NSAF's agricultural extension activities.

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Dr. David Guerena

Soil Scientist- Systems Agronomist
Nepal Seed and Fertilizer Project

DISCLAIMER: This document is made possible by the support of the American People through the United States Agency for International Development (USAID.) The contents of this document are the sole responsibility of the International Maize and Wheat Improvement Center (CIMMYT) and do not necessarily reflect the views of USAID or the United States Government.

BEST MANAGEMENT PRACTICES |

1. MOST SUITABLE VARIETY



2. HIGH QUALITY SEED

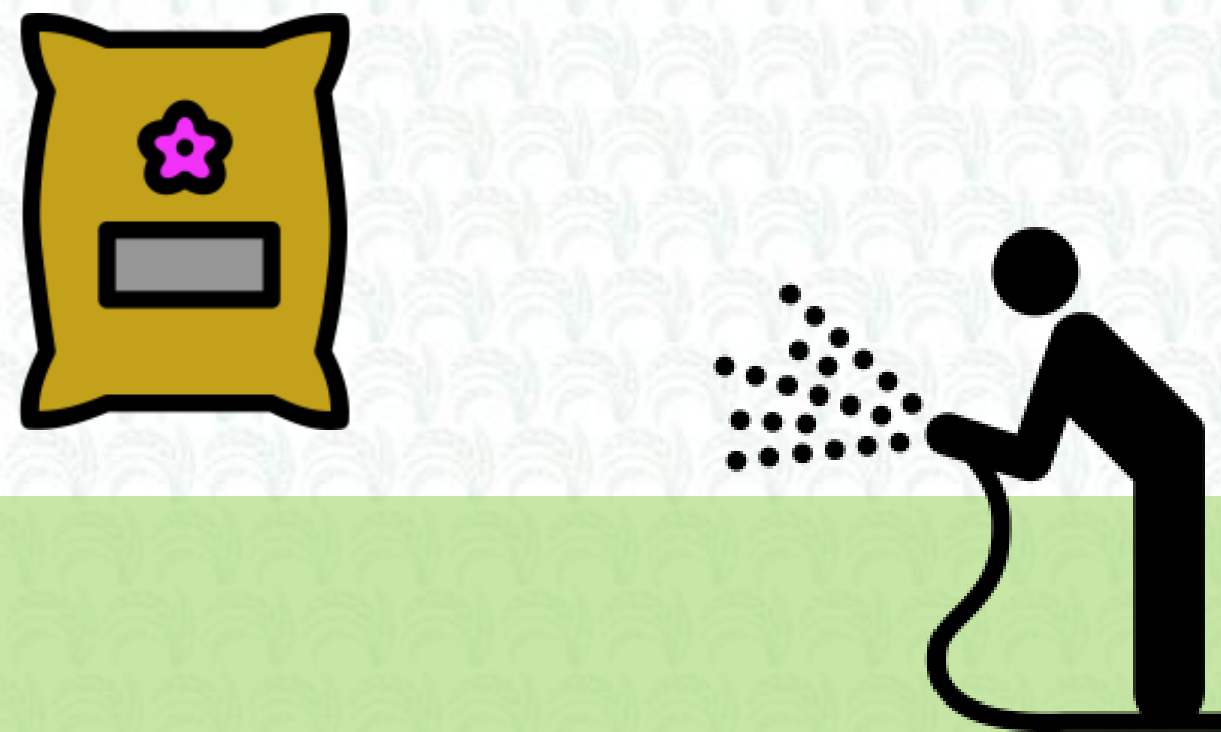


3. HEALTHY SEEDLINGS



4. FIELD PREPARATION AND PLANTING

5. OPTIMUM FERTILIZATION



6. TIMELY IRRIGATION

7. WEEDS, PEST AND DISEASES MANAGEMENT






8. HARVESTING

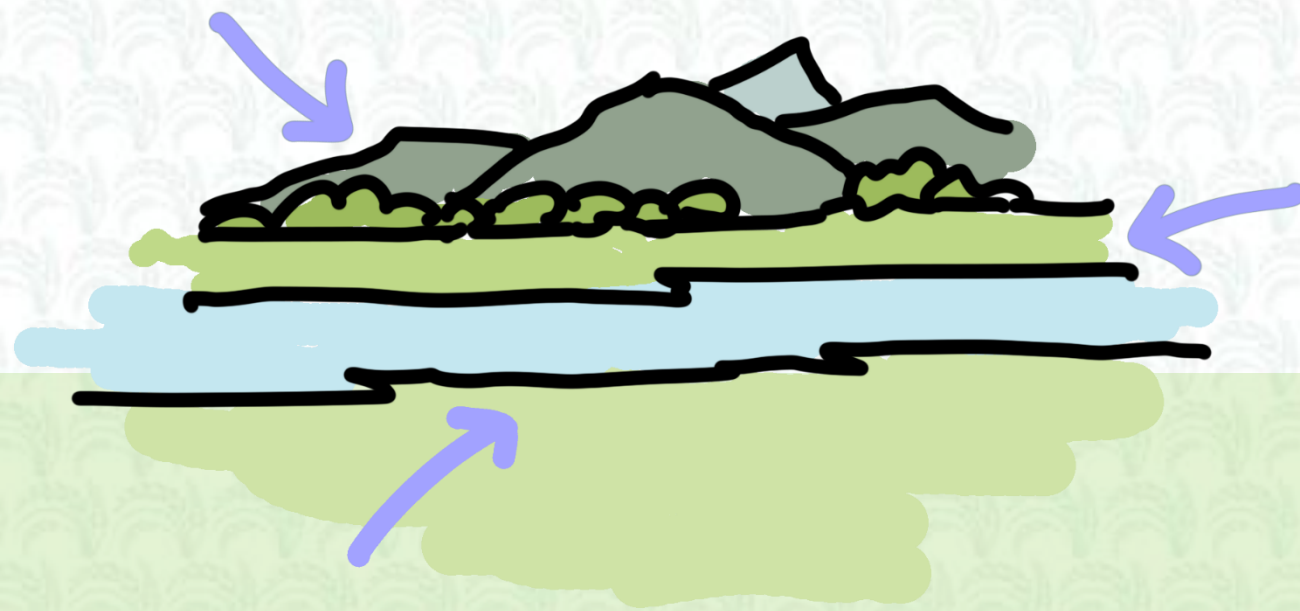


9. STORING



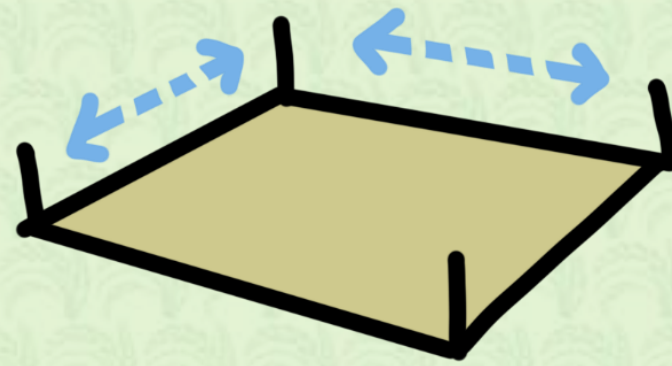
DEMO RESULTS (kg/kattha)

	National average yield	Recommended fertilizer + improved seed	Recommended fertilizer + improved seed with 4Rs
OVER ALL	105 	+109 	+135 

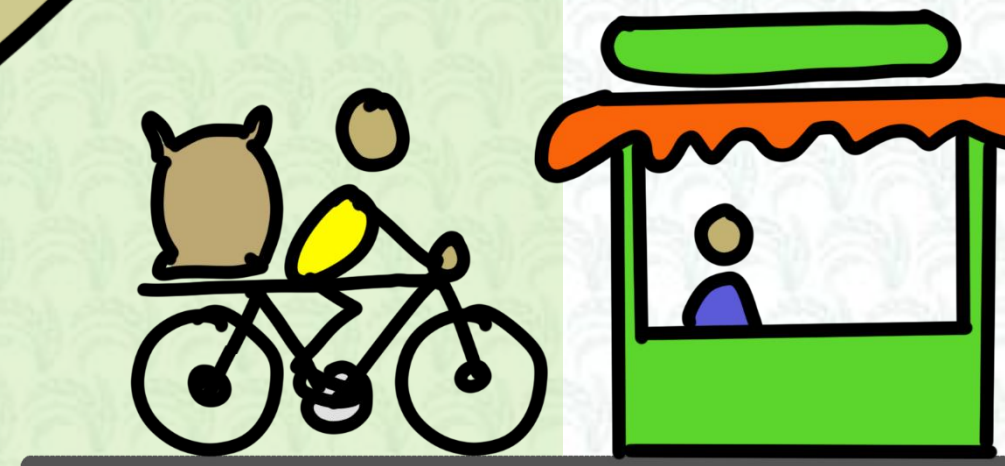


Land location

Land size to be cultivated



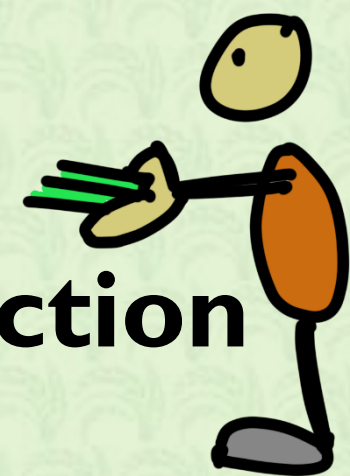
Purpose of rice cultivation



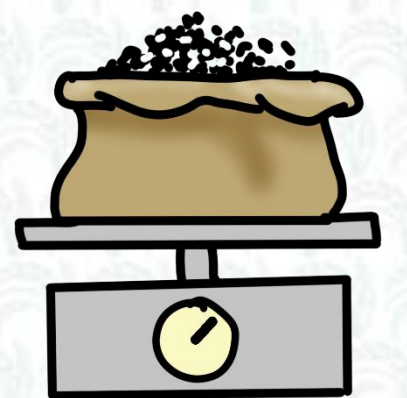
Rice variety



Net profit is calculated by deducting production cost from sales value.



All above will help you decide...



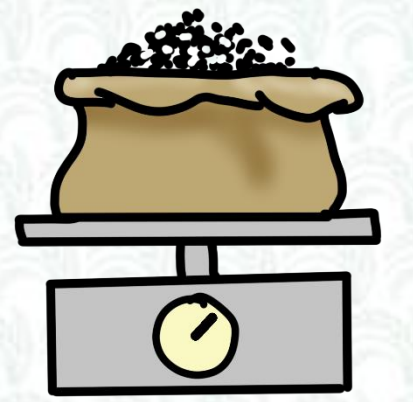
Quantity of seed



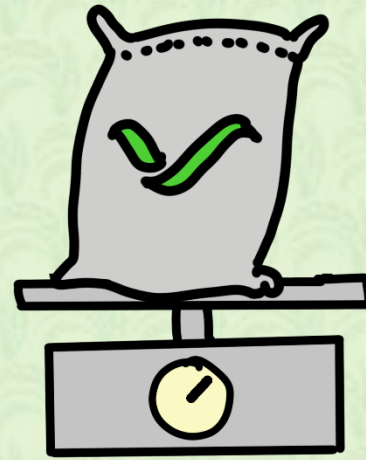
Quantity of fertilizer



Other inputs required



Quantity of seed

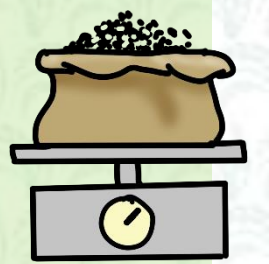


Quantity of fertilizer

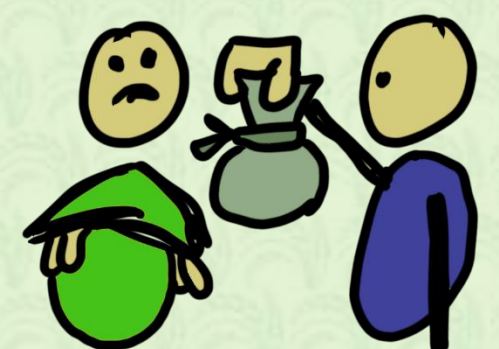


Other inputs required

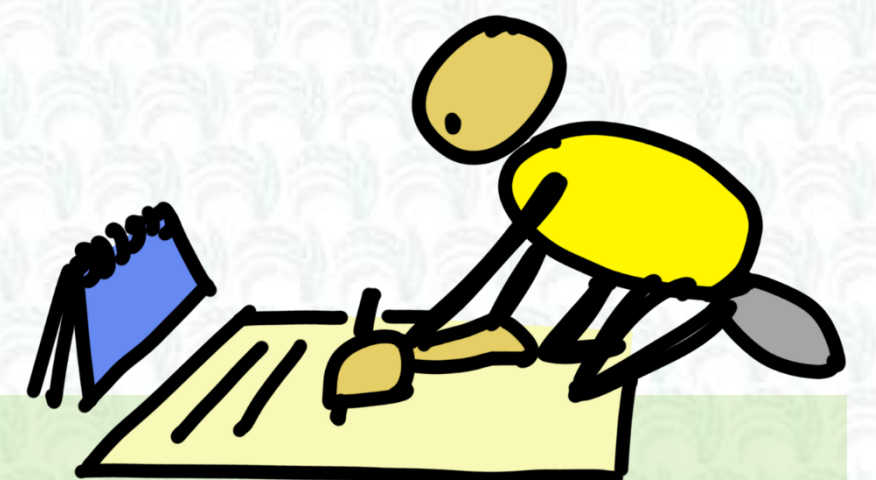
Cost of inputs



Source/availability of inputs









Based on all above, make a schedule of activities

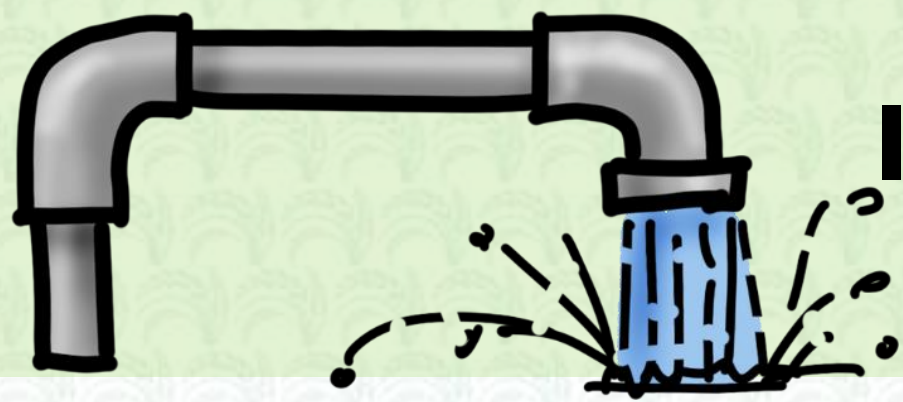
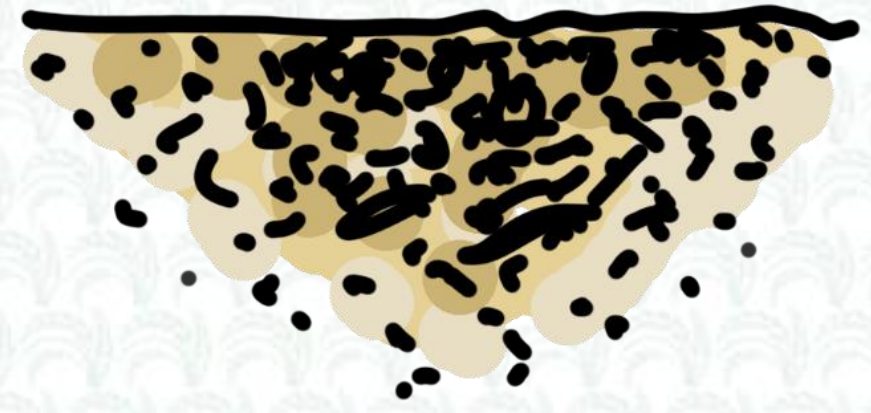


SELECTION OF SUITABLE VARIETY

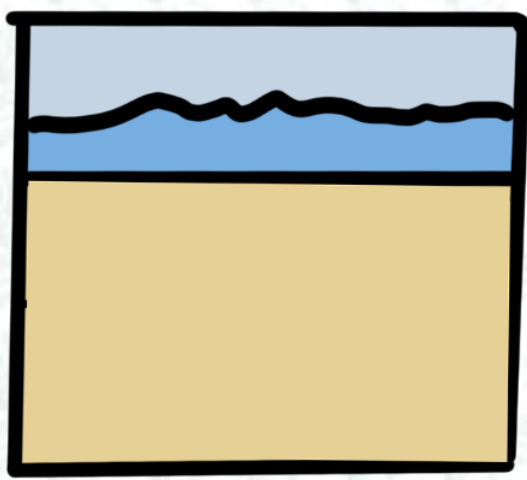
5

No.	Variety	Maturity days	Yield (tonne/ha)	
1	Sukkhadhan-3	122-125	2.5-3.6	 A photograph of a rice field with golden-yellow rice plants. A small yellow sign in the foreground reads "SAHBHAGI DHAN".
2	Sukkhadhan-6	120-125	3-4	 A photograph of a rice field with green rice plants, showing the panicle stage.
3	Ceiharang Sub-1	122-125	4.4	 A photograph of a rice field with golden rice plants. A person is holding a white sign that reads "CEIHARANG SUB 1" and "सेहराङ्ग सब १".
4	Radha-14	132	4.4	 A photograph of a rice field with green rice plants.
5	Lalka Basmati	150	2.5-3.5	 A photograph of a rice field with golden rice plants. A sign in the foreground reads "रातो बासमती" and "Rato Basmati".
6	Khumal-4	144	6.3	 A photograph of a rice field with golden rice plants. A date stamp in the bottom right corner reads "20/09/2013 20:36".
7	US-312	132	5.46	

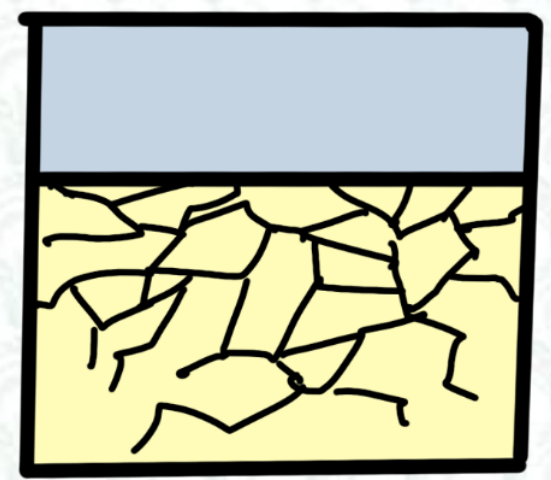
Soil fertility



Irrigation potential

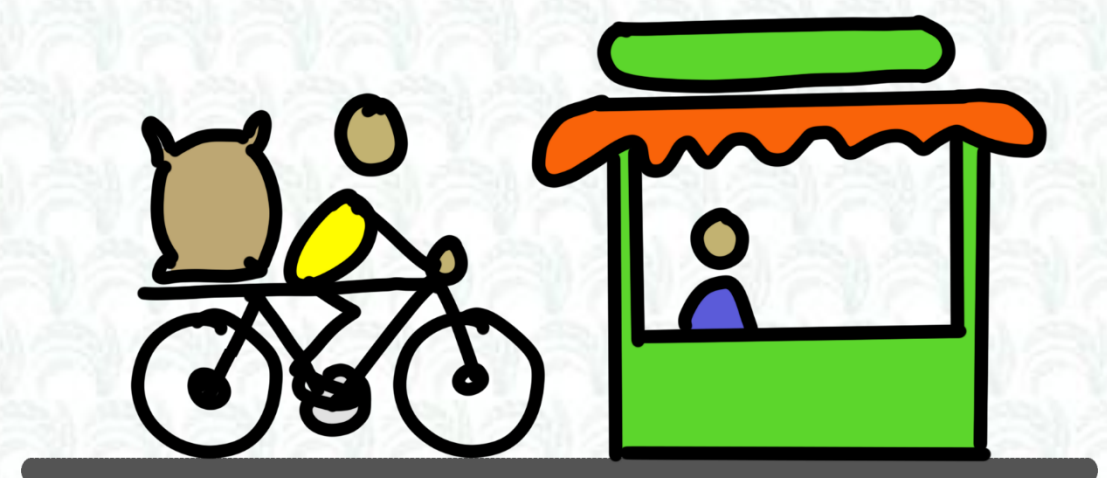


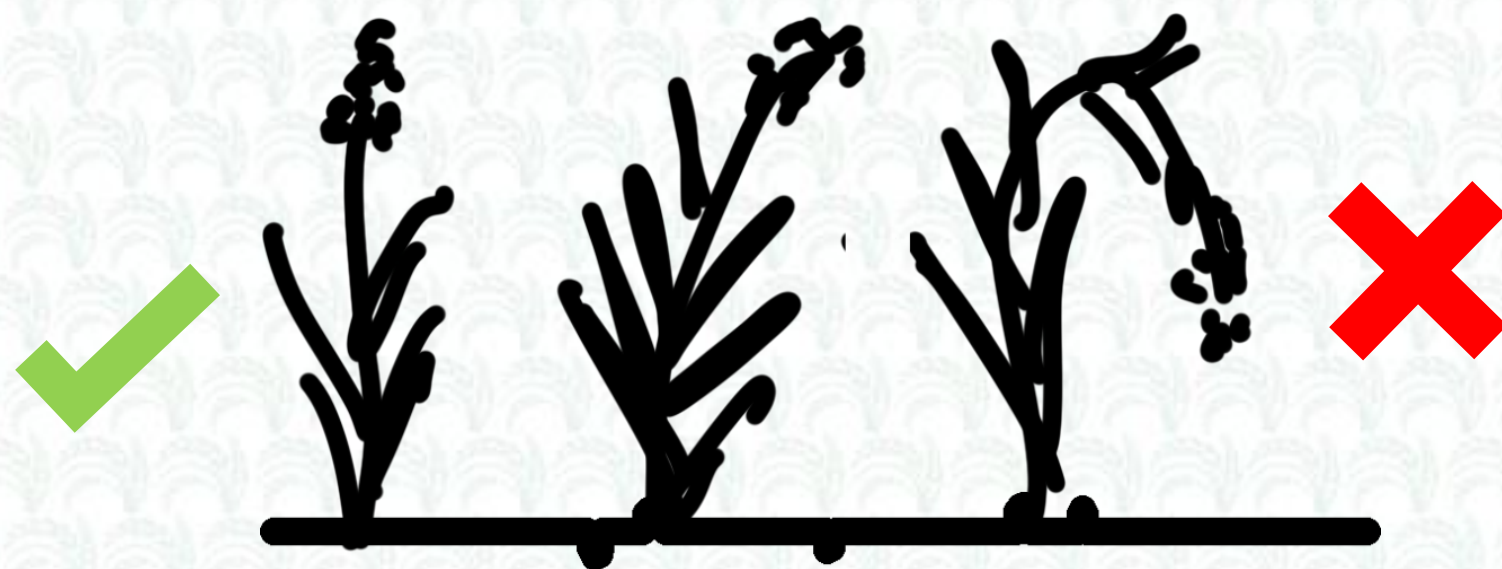
Possibility of flooding or drought



Good yield and taste

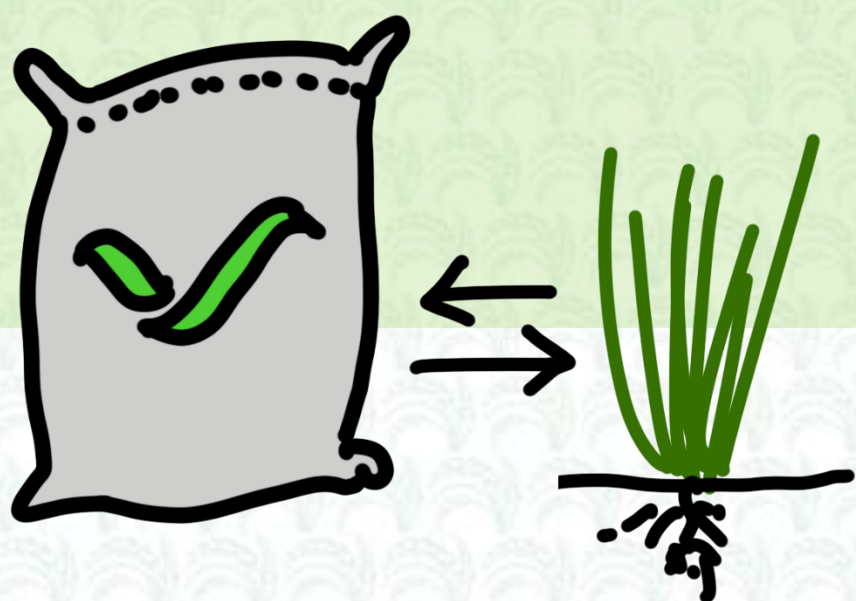
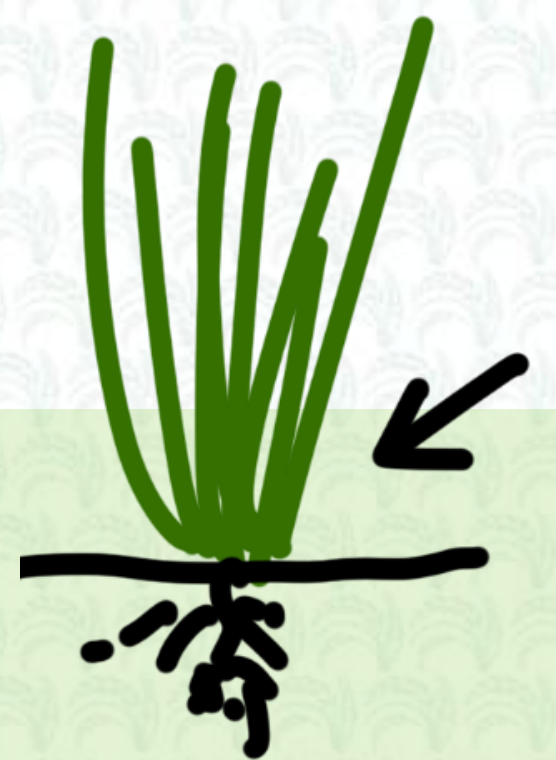
High market price



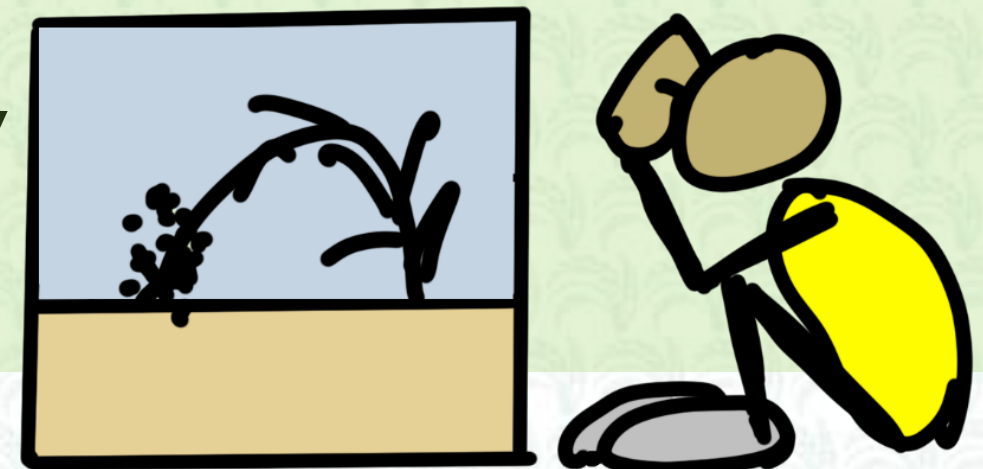


Medium to short in plant height

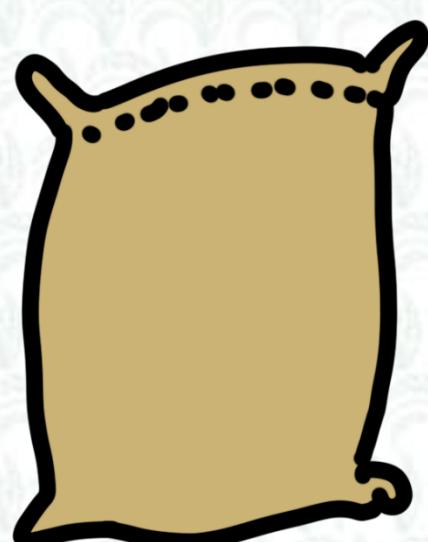
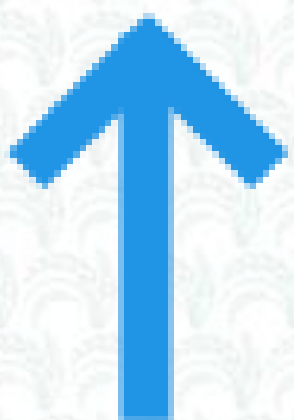
Produce many tillers



Doesn't lodge easily



Responsive to inorganic fertilizers



can give high yields



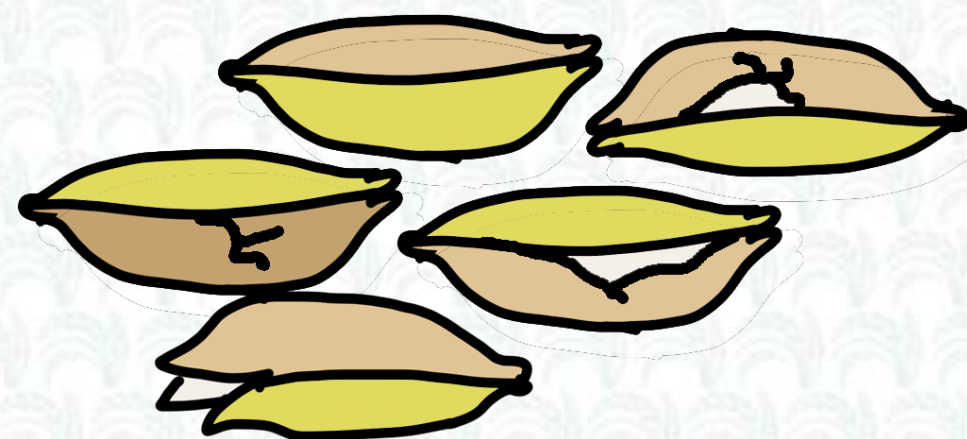
Clean

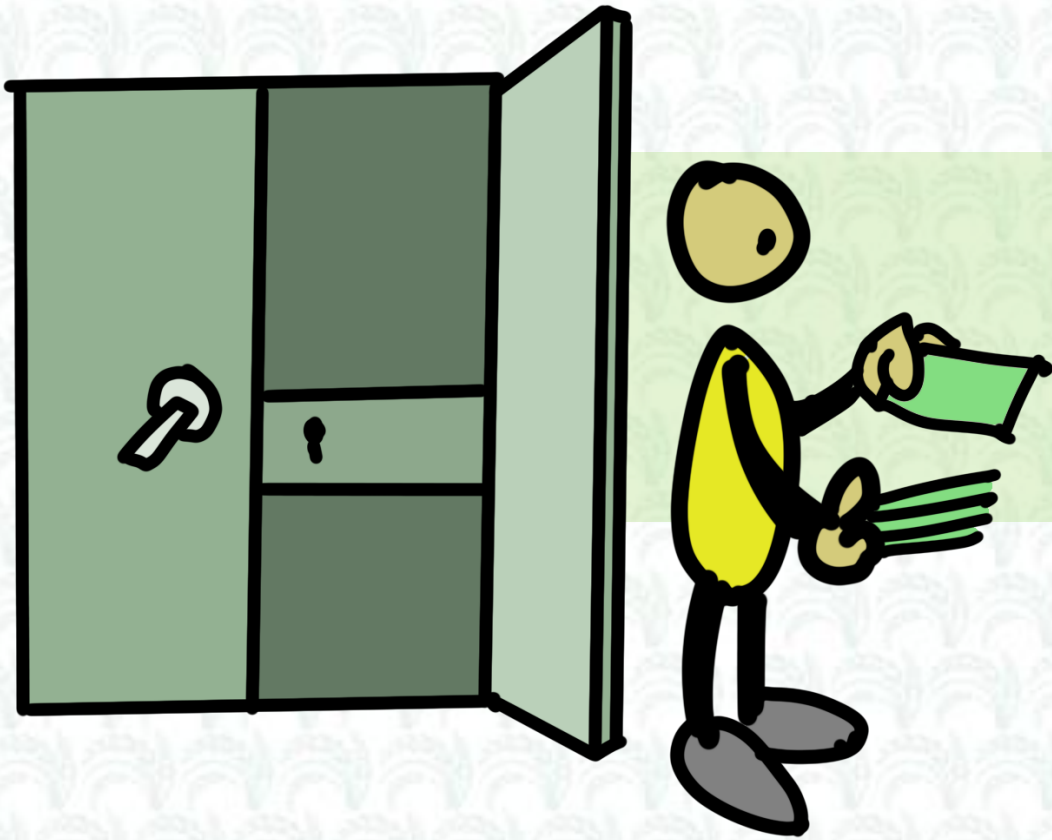


Pure



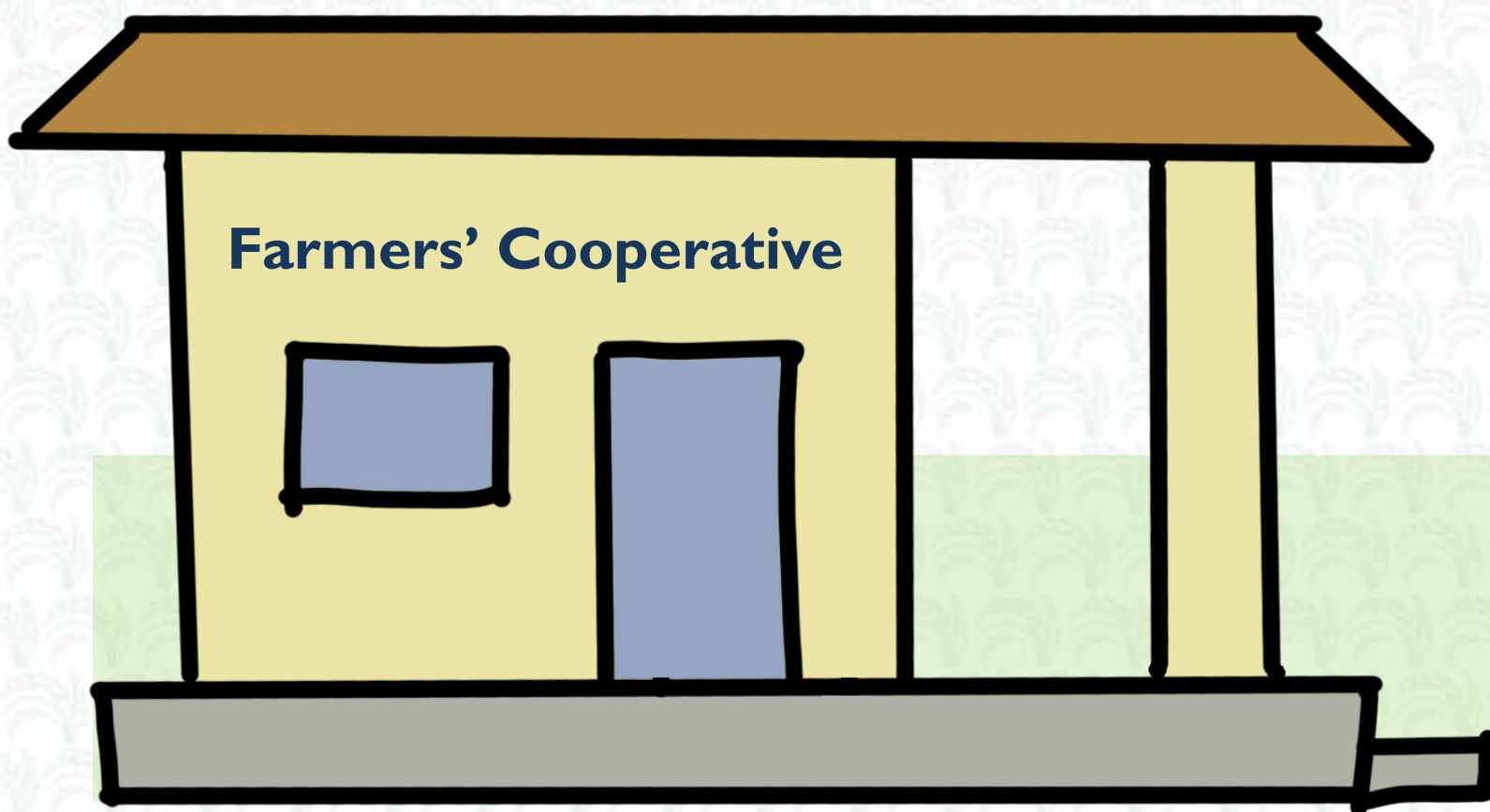
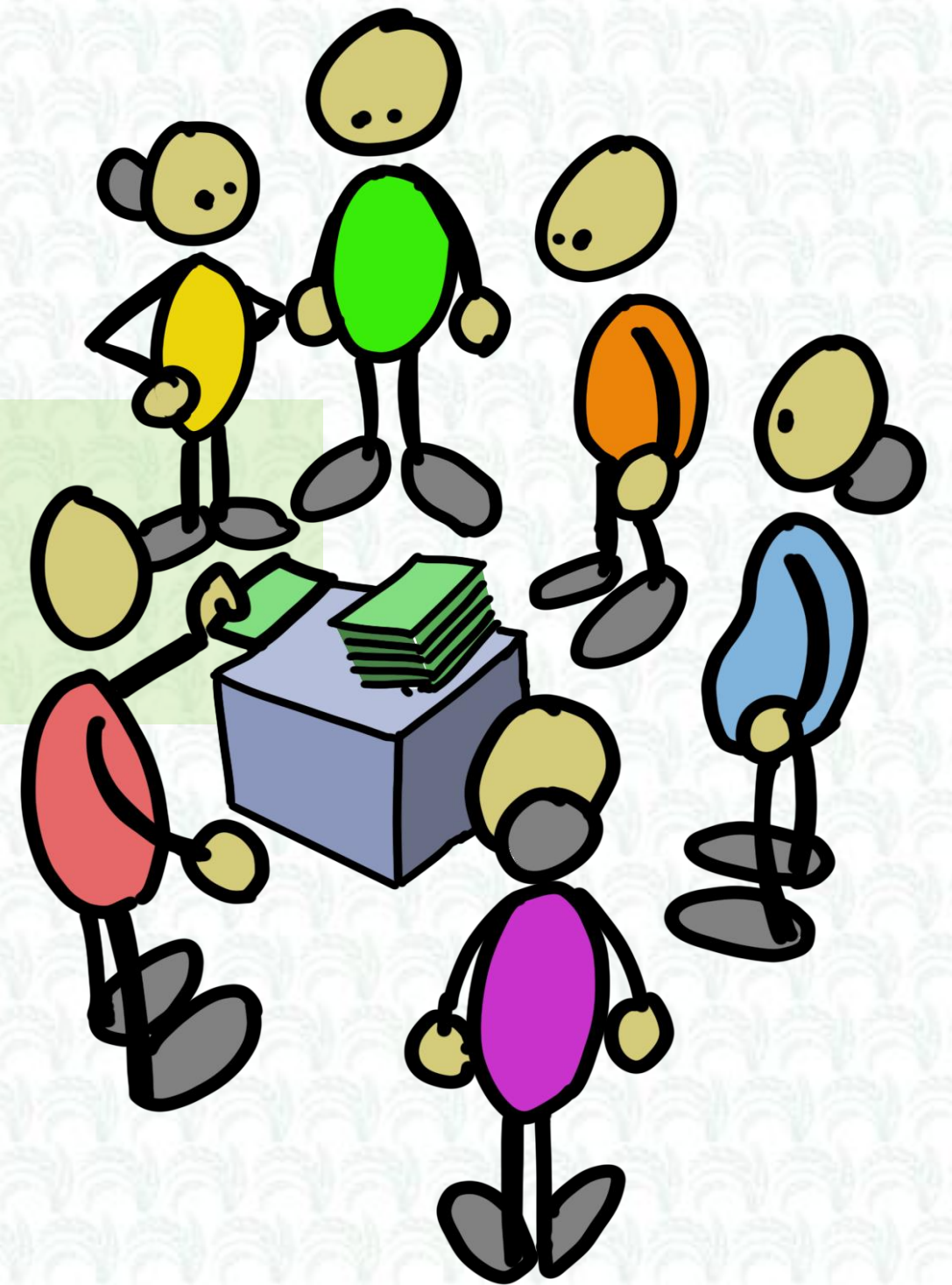
Healthy





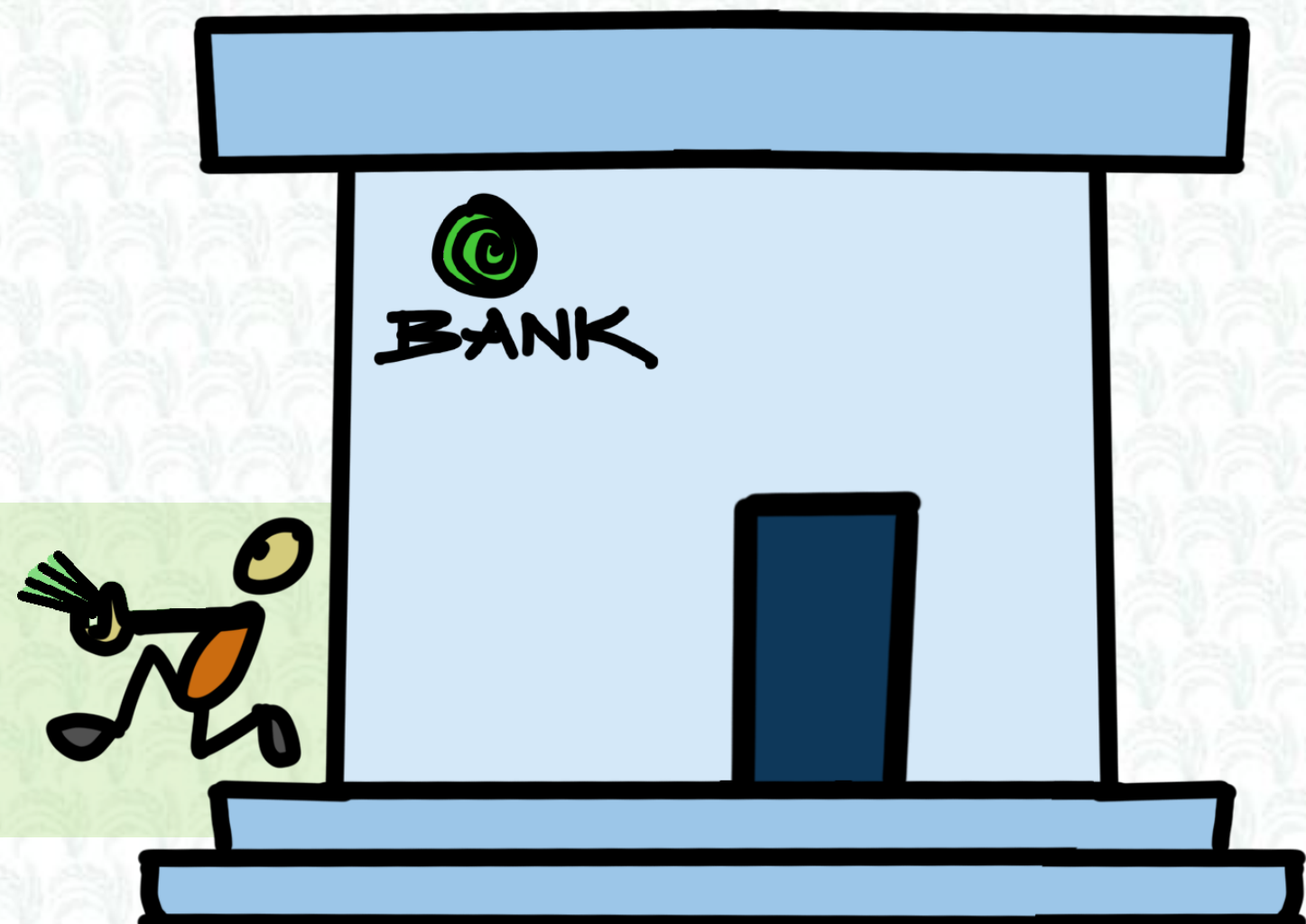
Personal Saving

Group Saving



Cooperative

Bank



1ST
MONTH



2ND
MONTH



3RD
MONTH



4TH
MONTH



5TH
MONTH



FIELD PREPARATION

||

Organic manures (300-500 kg
compost/FYM per kattha)
should be applied and
incorporated in soil at least 15
days prior to transplanting



Land is ploughed with
mouldboard plough 2-3
times to obtain fine tilth
and make the field puddled

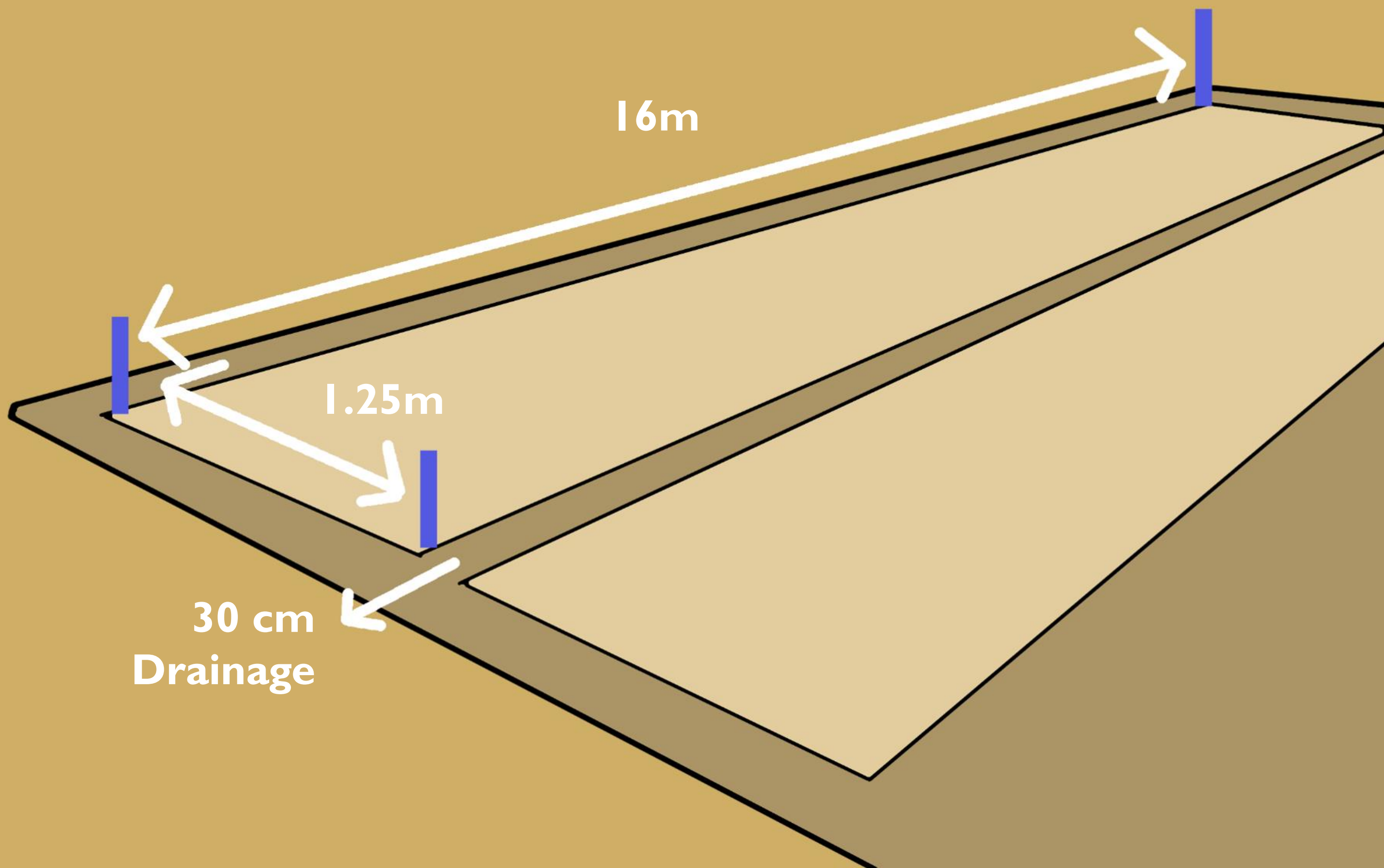


SEEDBED PREPARATION

12

Seed bed requires 5-10% of the total crop area. Prepare 20m² seedbed for transplanting one kattha of land.

Prepare 1.25m wide and 16m long bed.

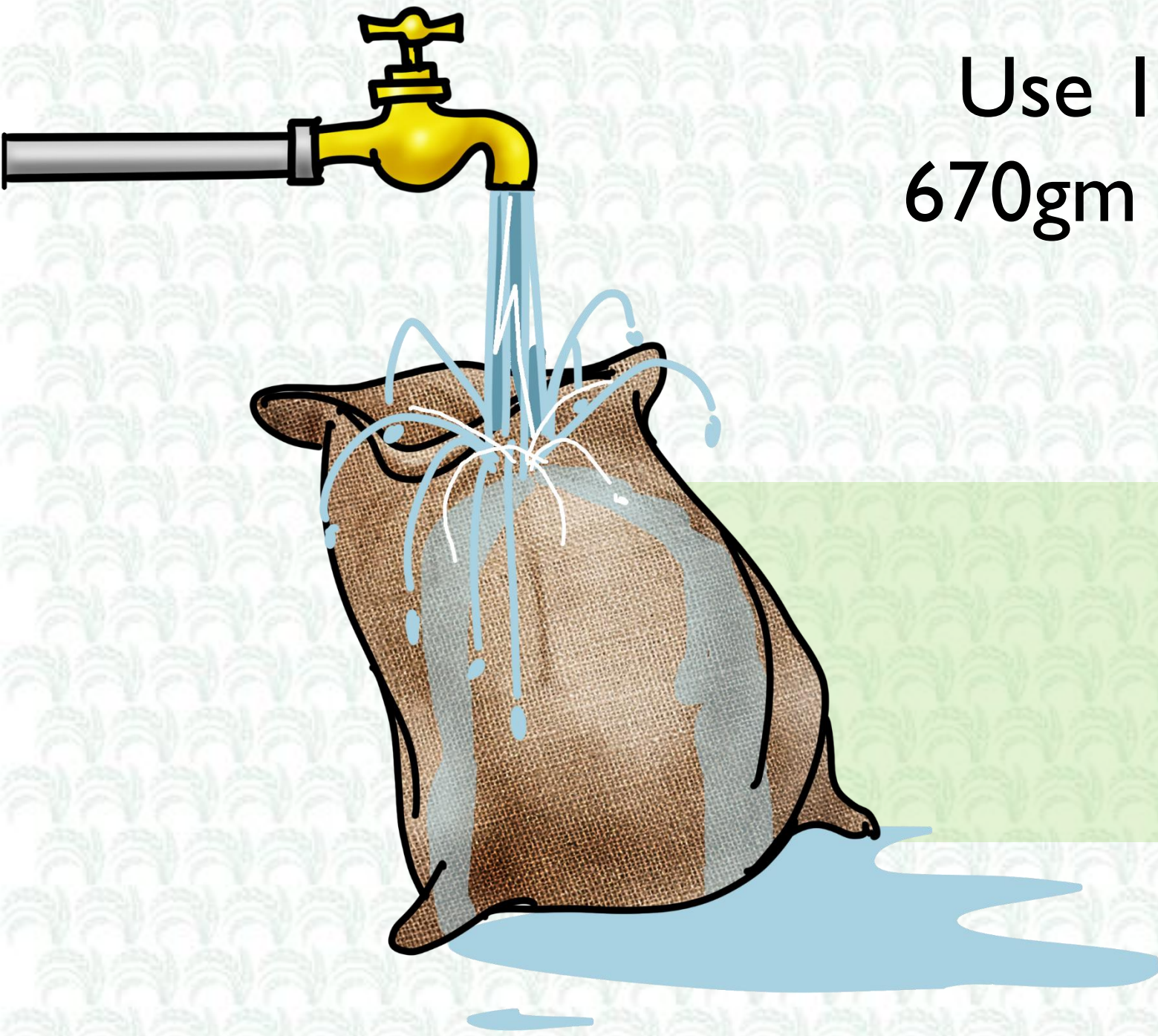


20kg compost/ FYM is uniformly incorporated in the soil before ploughing the nursery bed.



350gm DAP is uniformly incorporated in the bed before seed sowing.





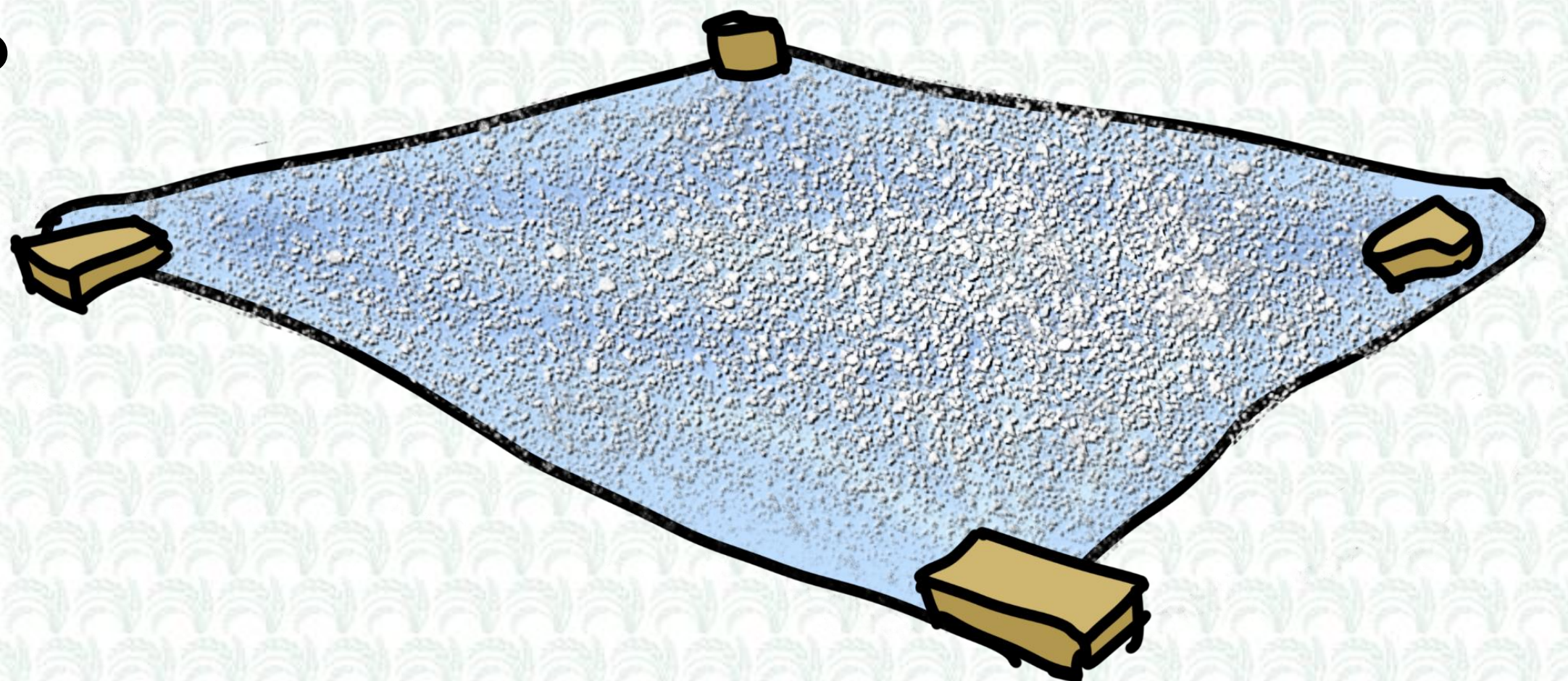
Use 1.67kg for improved variety OR 670gm for hybrid seed for one kattha.

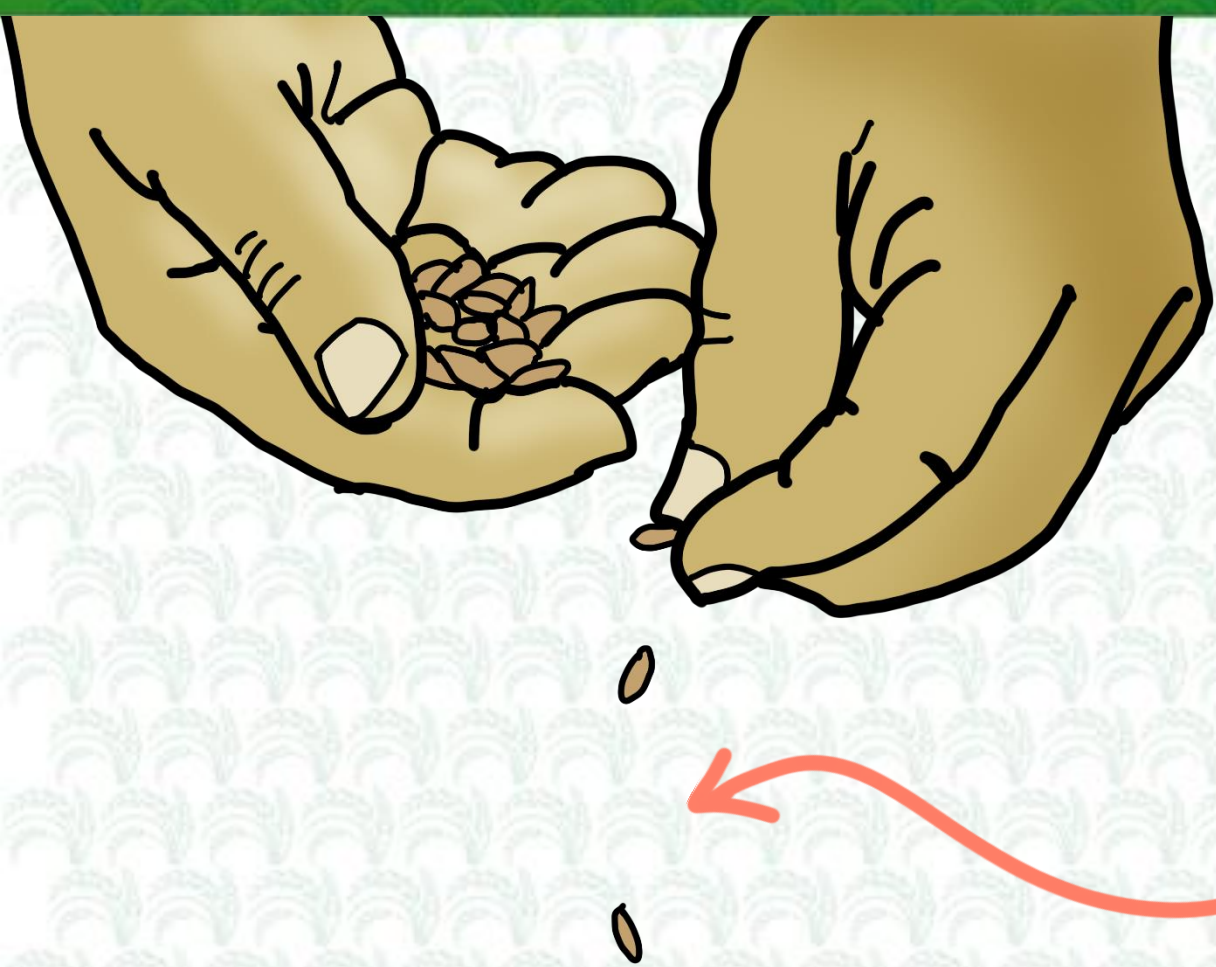
Seed is soaked in water inside jute/cotton bag.

Leave at room temperature for 8 hours and rinse with fresh water.



Keep the seed spread in shade for sprouting if required, spray water to maintain enough moisture for sprouting.





Uniform broadcasting
or line sowing of
seeds at 5cm spacing
about 2 cm deep



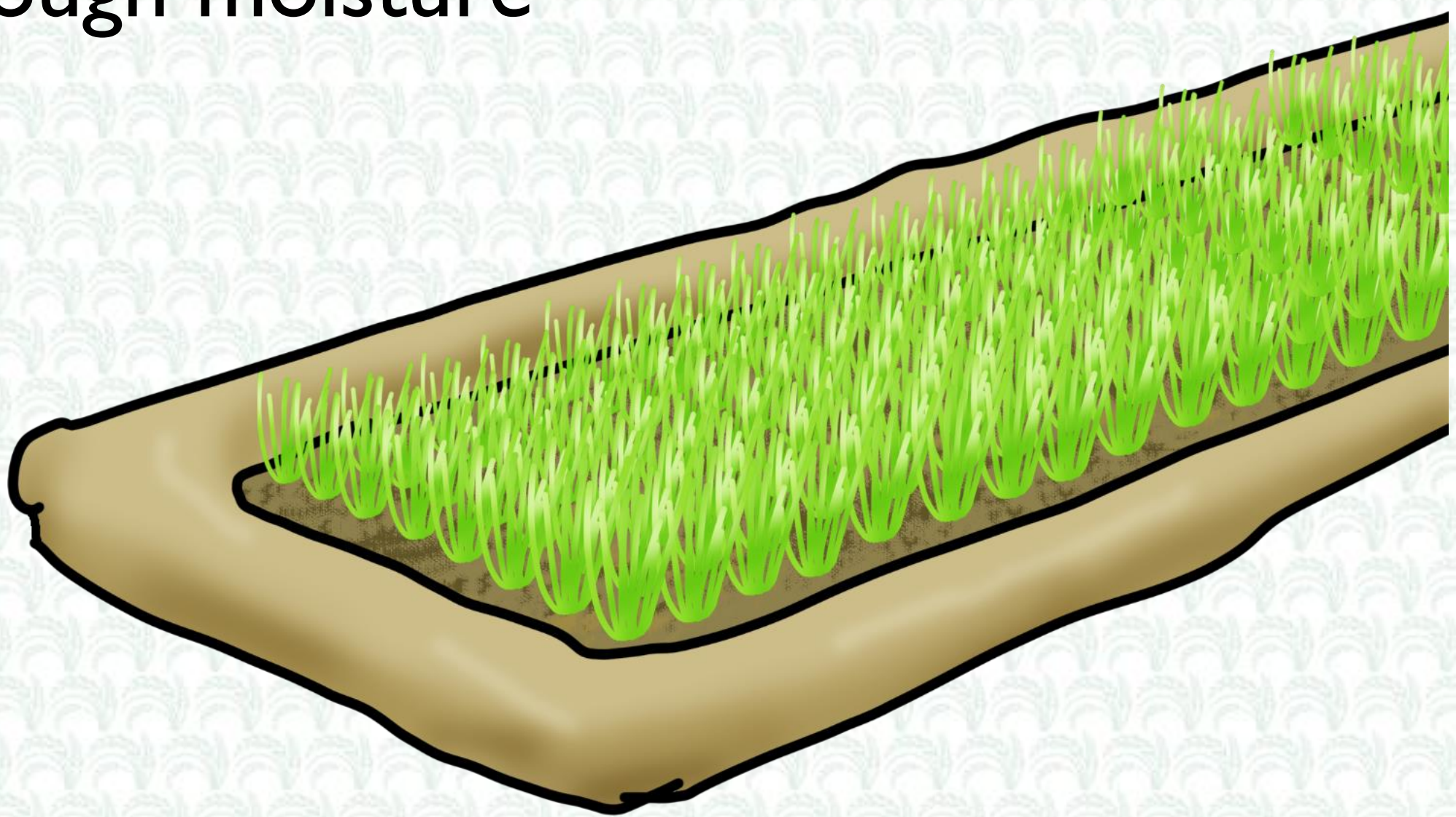
Keep the bed saturated for first 5 days but water should not be very hot. Then, increase water level to 5cm.



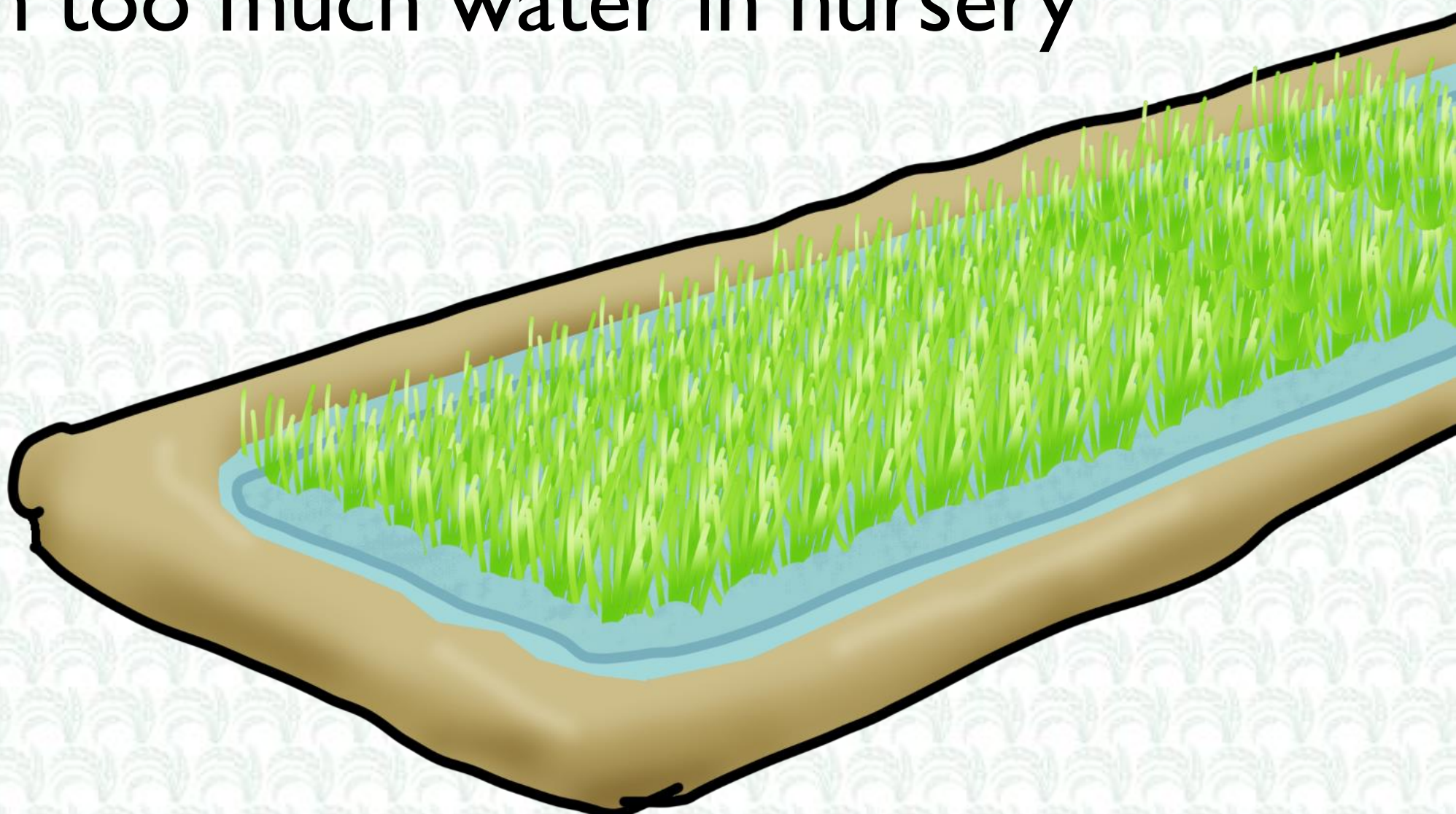
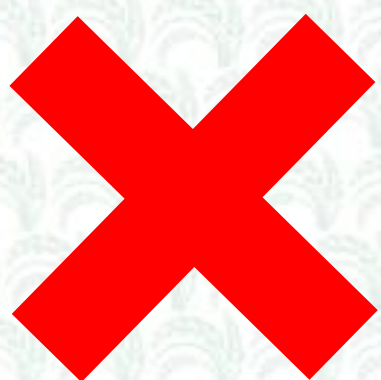


200gm urea is top-dressed after
10 days of seed sowing

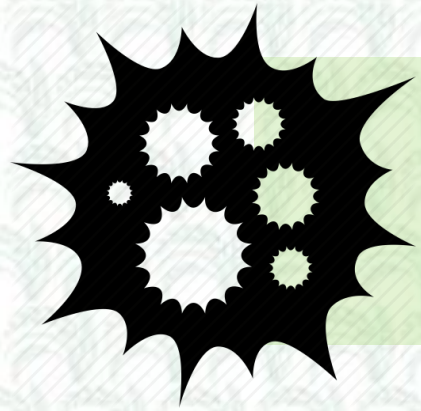
There should be enough moisture



but not flooded with too much water in nursery



INSPECT THE NURSERY REGULARLY FOR:



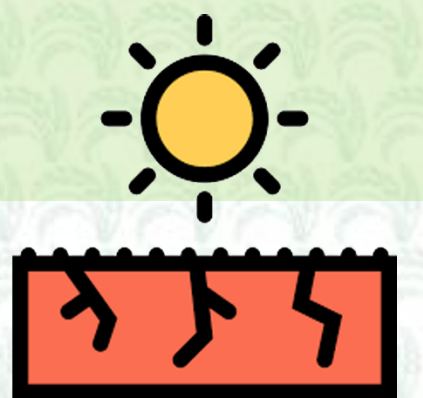
Pest and Disease Infestation

Seedlings Growth/Height, Health

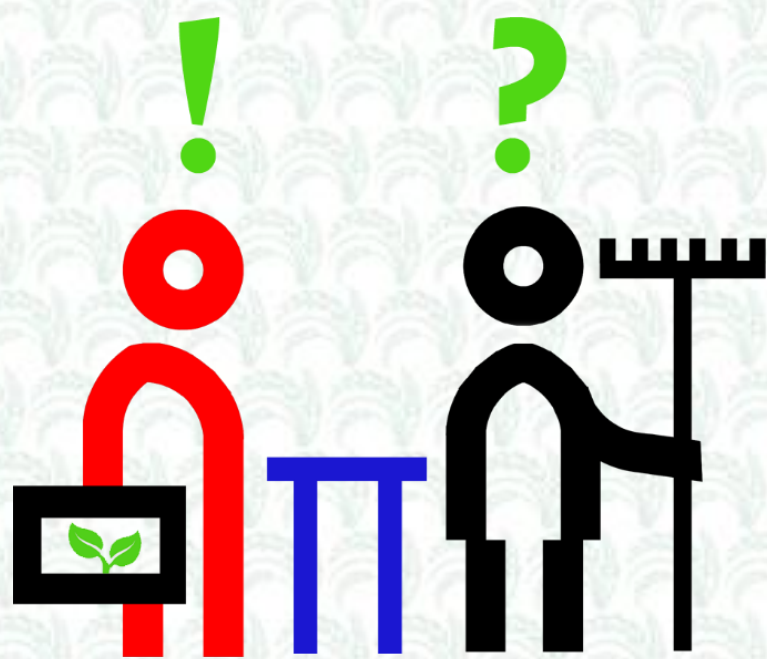


Weed Dominance

Water Scarcity/Excess



Animal Damage



Consult
agri.tech/agro-vet
for any advice





YOUNGER SEEDLINGS
more chances of mortality



SEEDLING IS READY
by 20-25 days



OVER AGED SEEDLINGS
negative impact on tillering and growth

Irrigate the nursery at least 12 hours before uprooting seedlings





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

INTEGRATED SOIL FERTILITY MANAGEMENT

PART TWO

TRANSPLANTING AND CROP MANAGEMENT



USAID
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IFDC
Developing Agriculture from the Ground Up

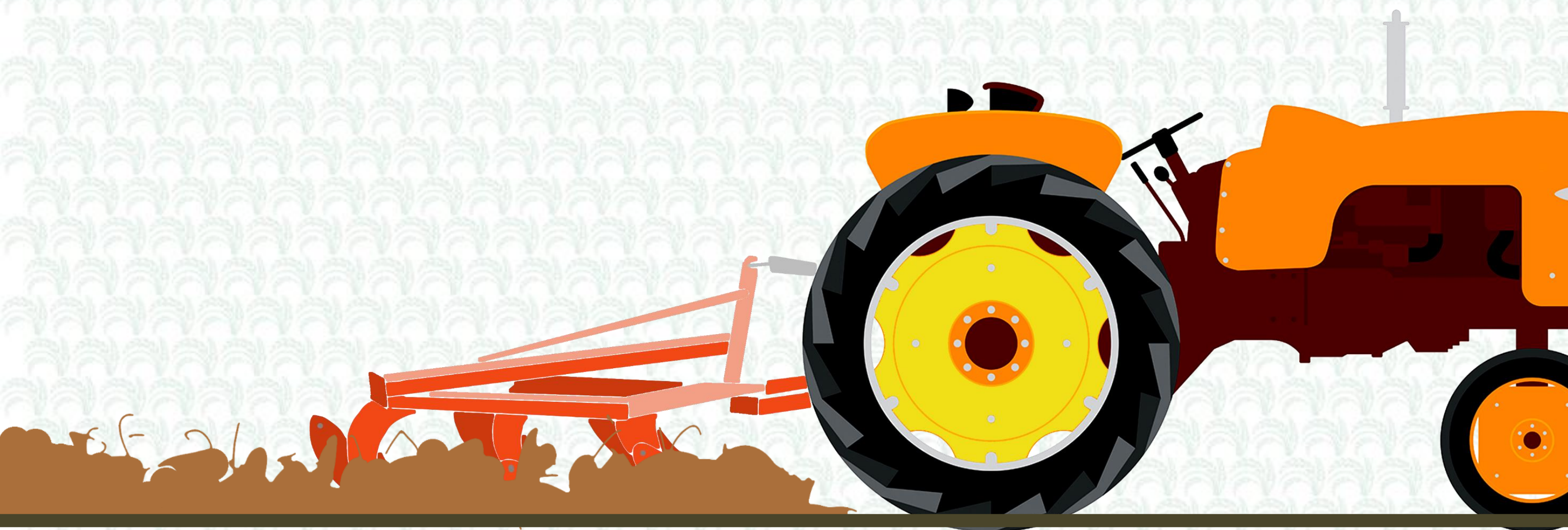
CIMMYT
International Maize and Wheat Improvement Center

PLANTING FERTILIZERS

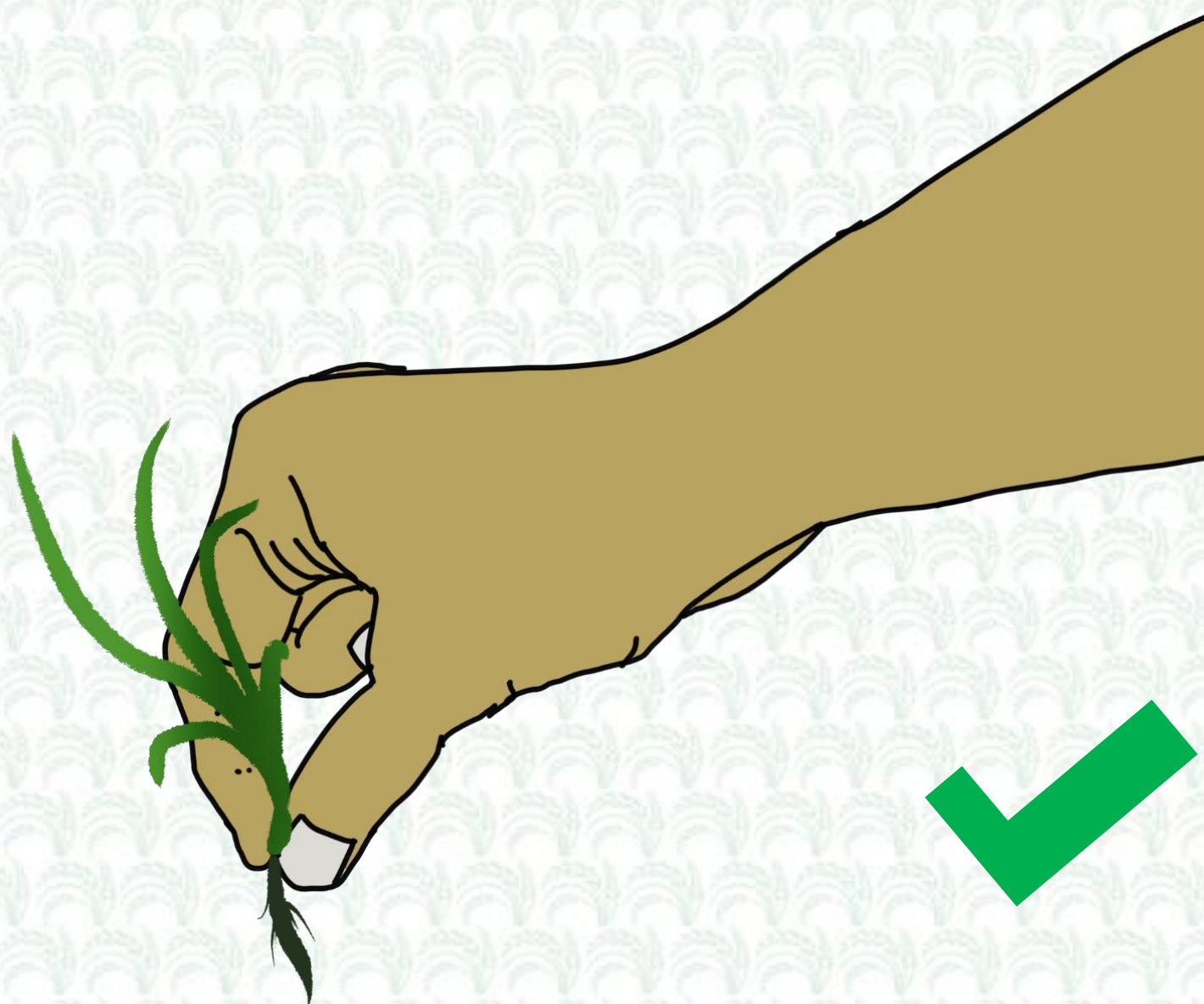
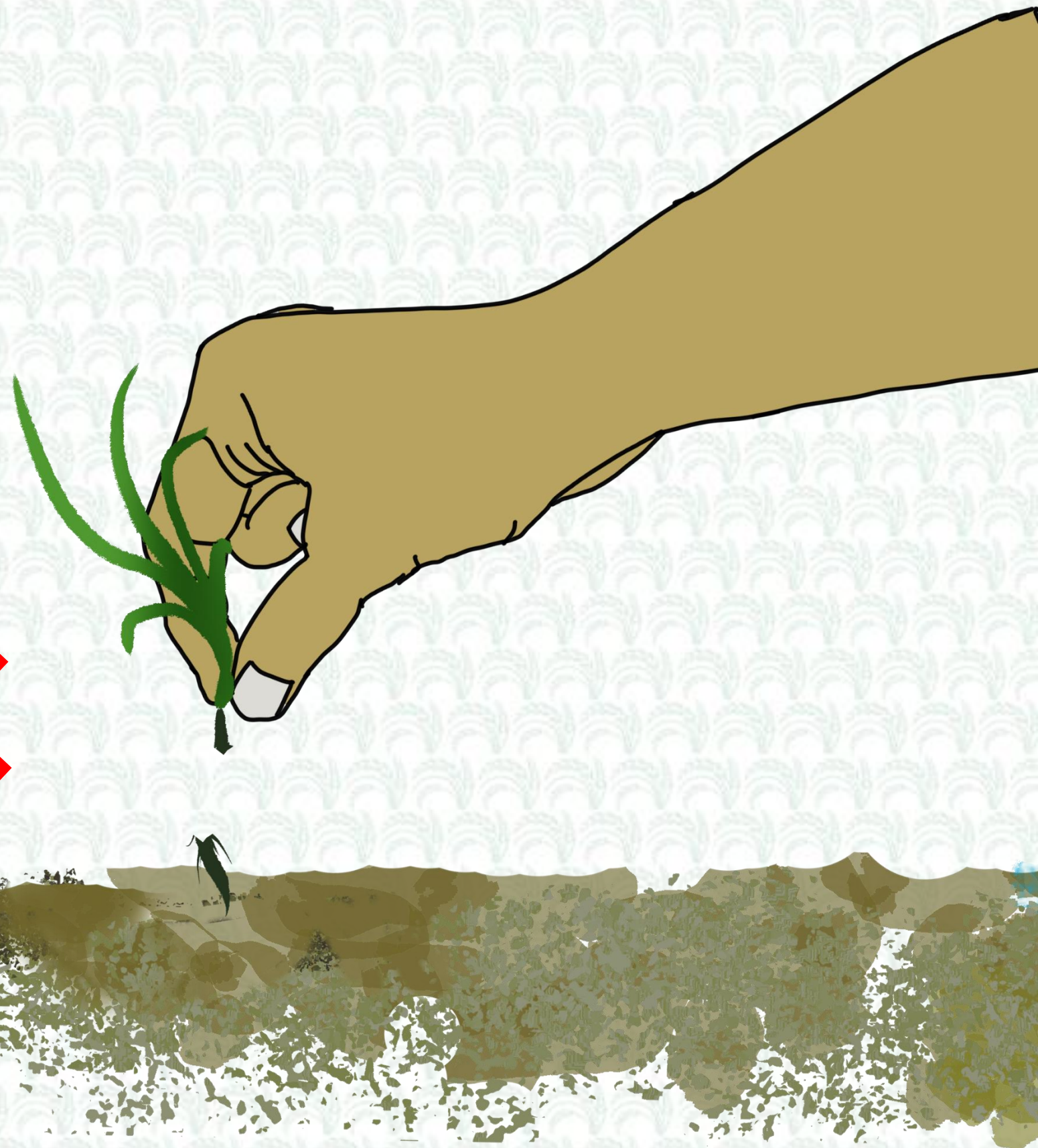
All planting fertilizers (DAP 2.1kg and MOP 1.7kg) are broadcasted as basal dose before last ploughing of land.



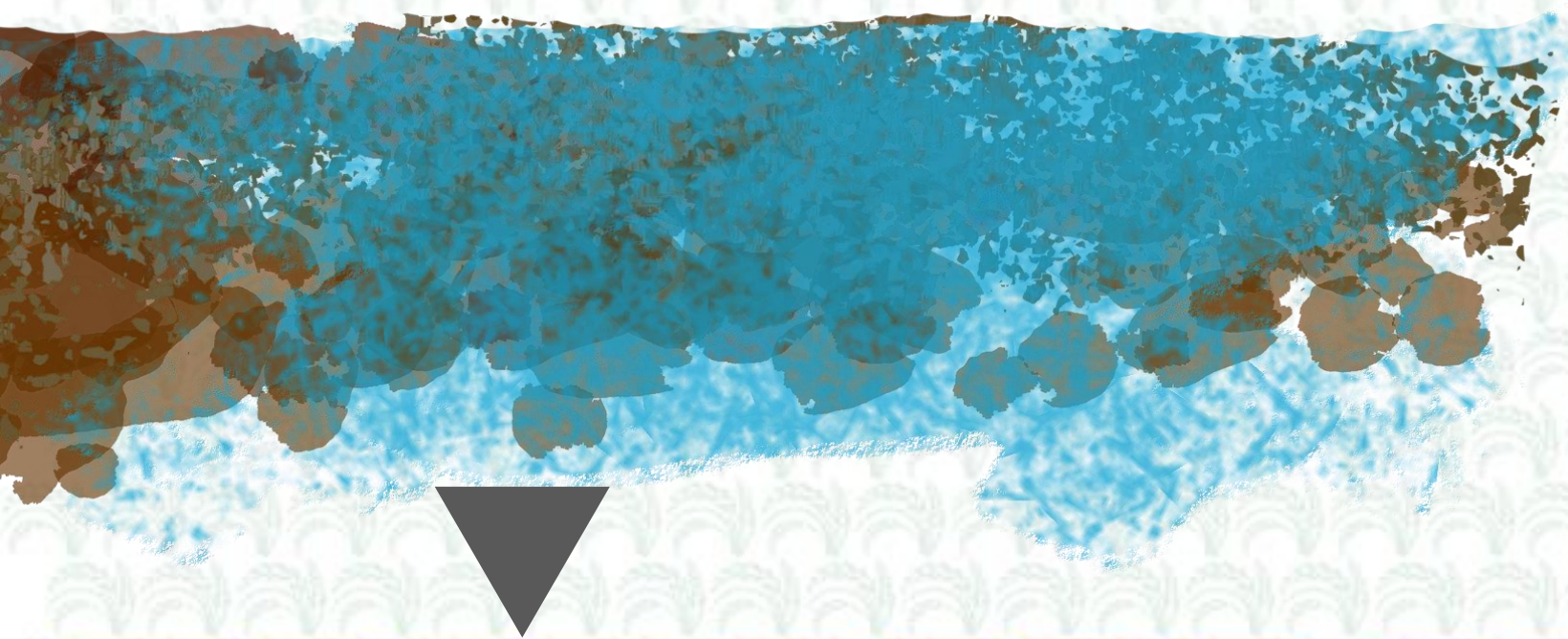
Last ploughing of land should be done after applying planting fertilizers.



Roots get damaged if seedlings are uprooted when bed is dry or soil is compact.



Irrigate nursery to soften the soil before uprooting the seedlings to avoid root damage.



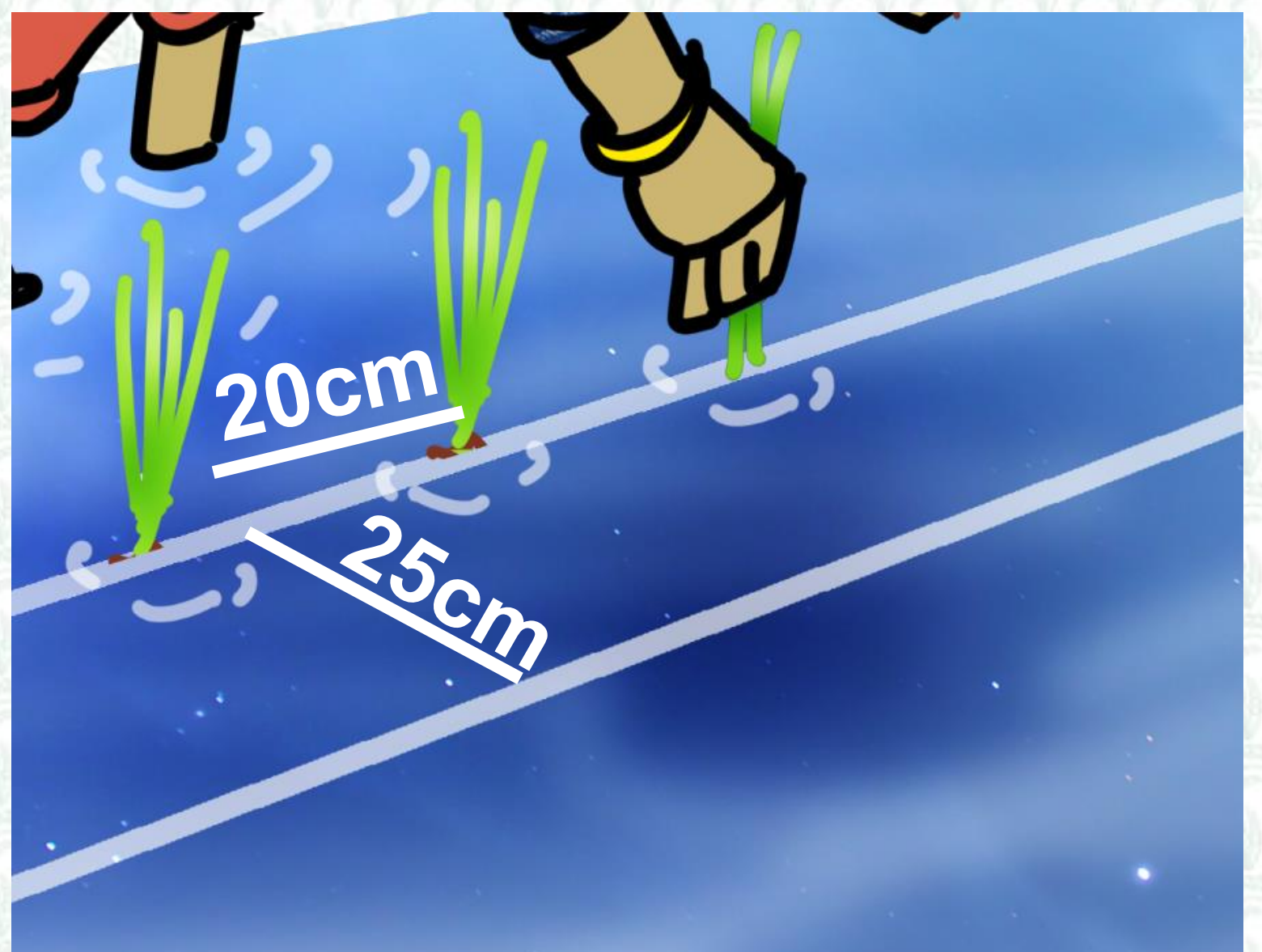
IMPROVED VARIETIES

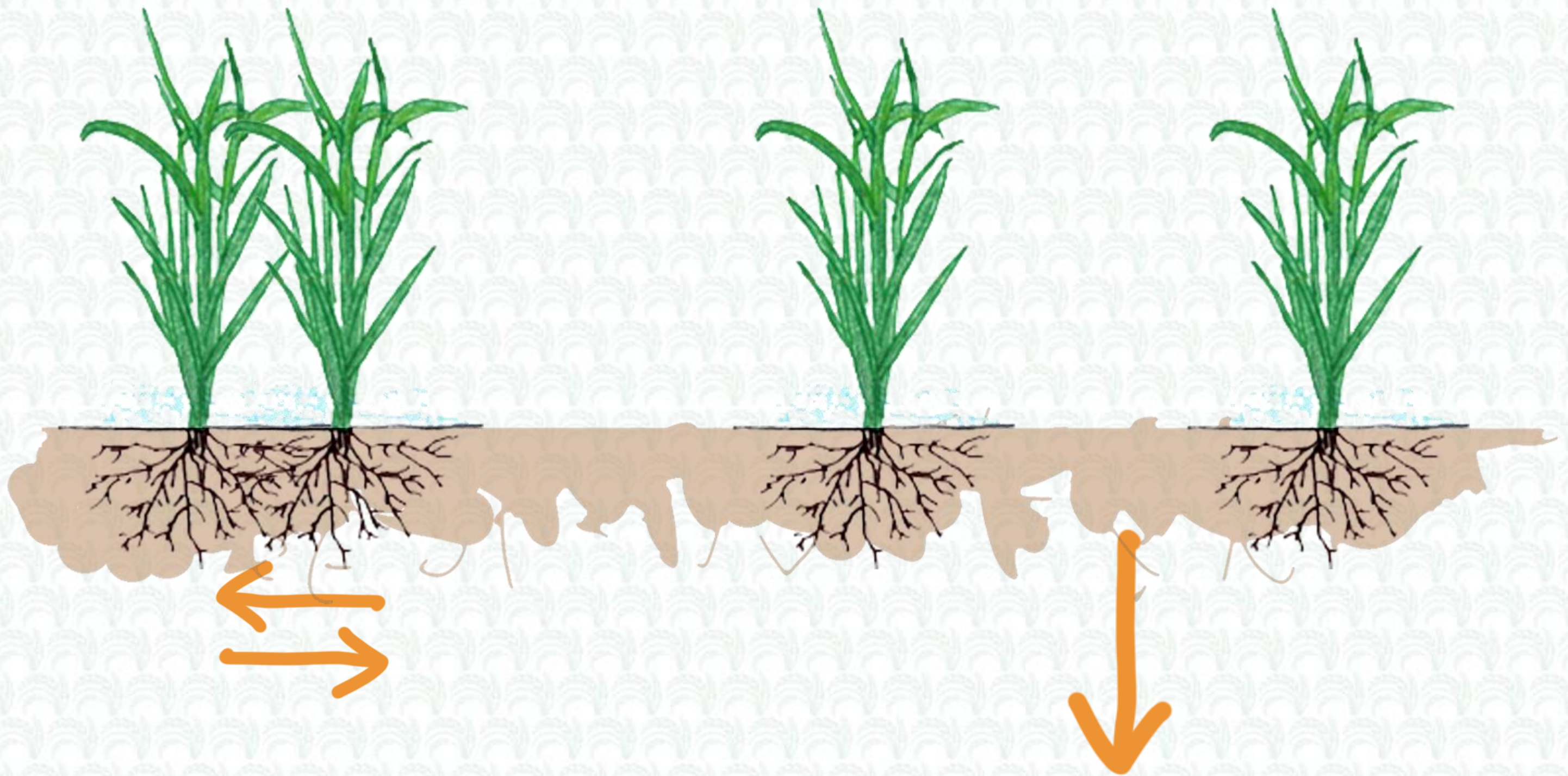
2-3 seedlings per hill at
20 x 20cm spacing



HYBRID

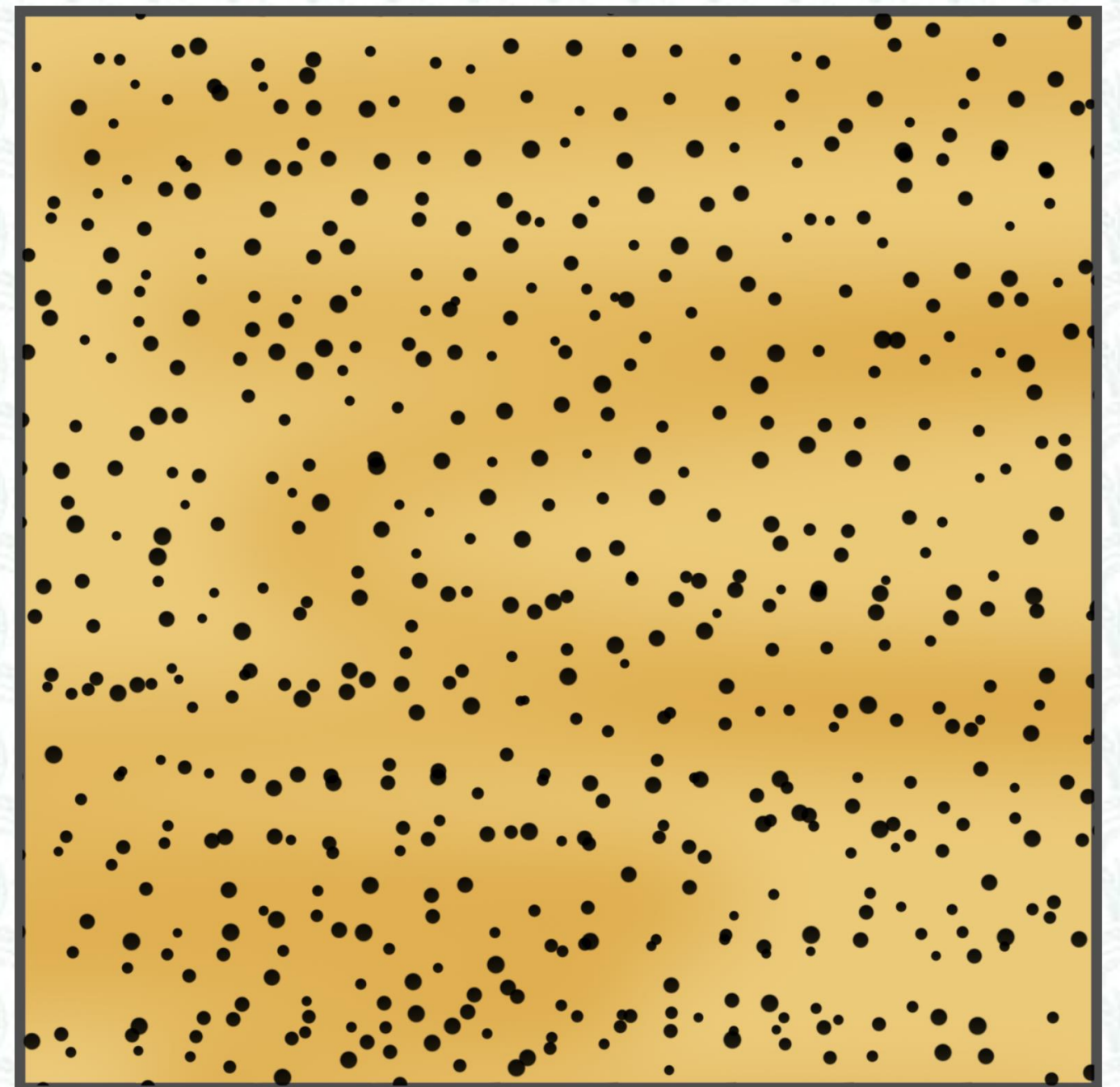
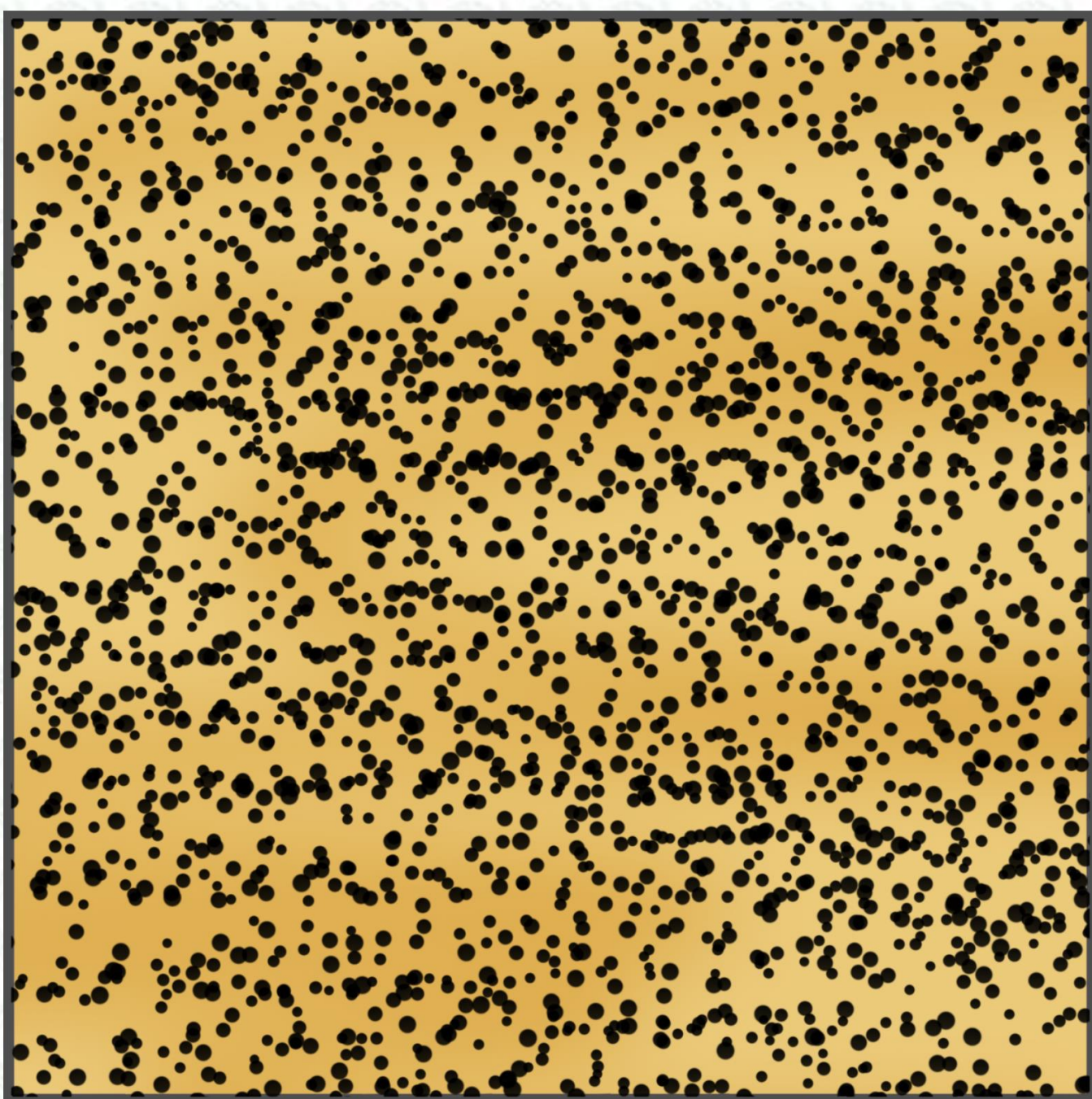
1 seedling per hill at
25 x 20cm spacing





Increases competition

Land wastage

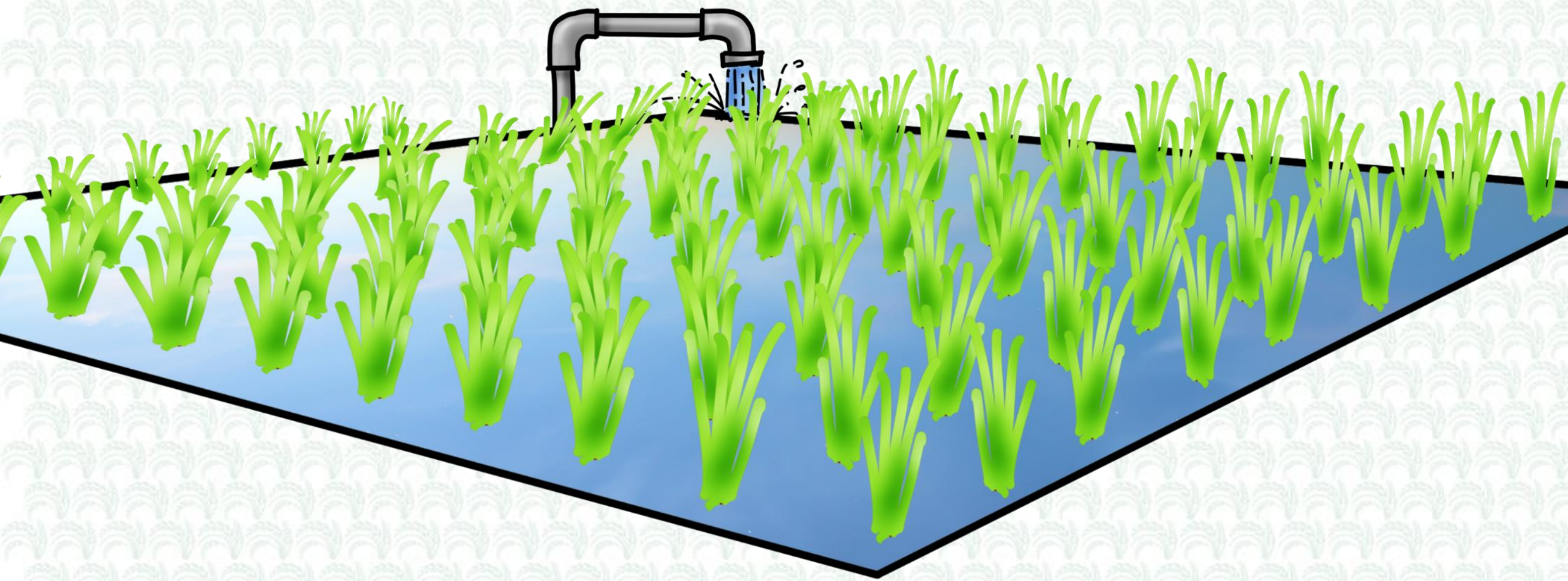


Use the surplus seedlings left in nursery for gap filling

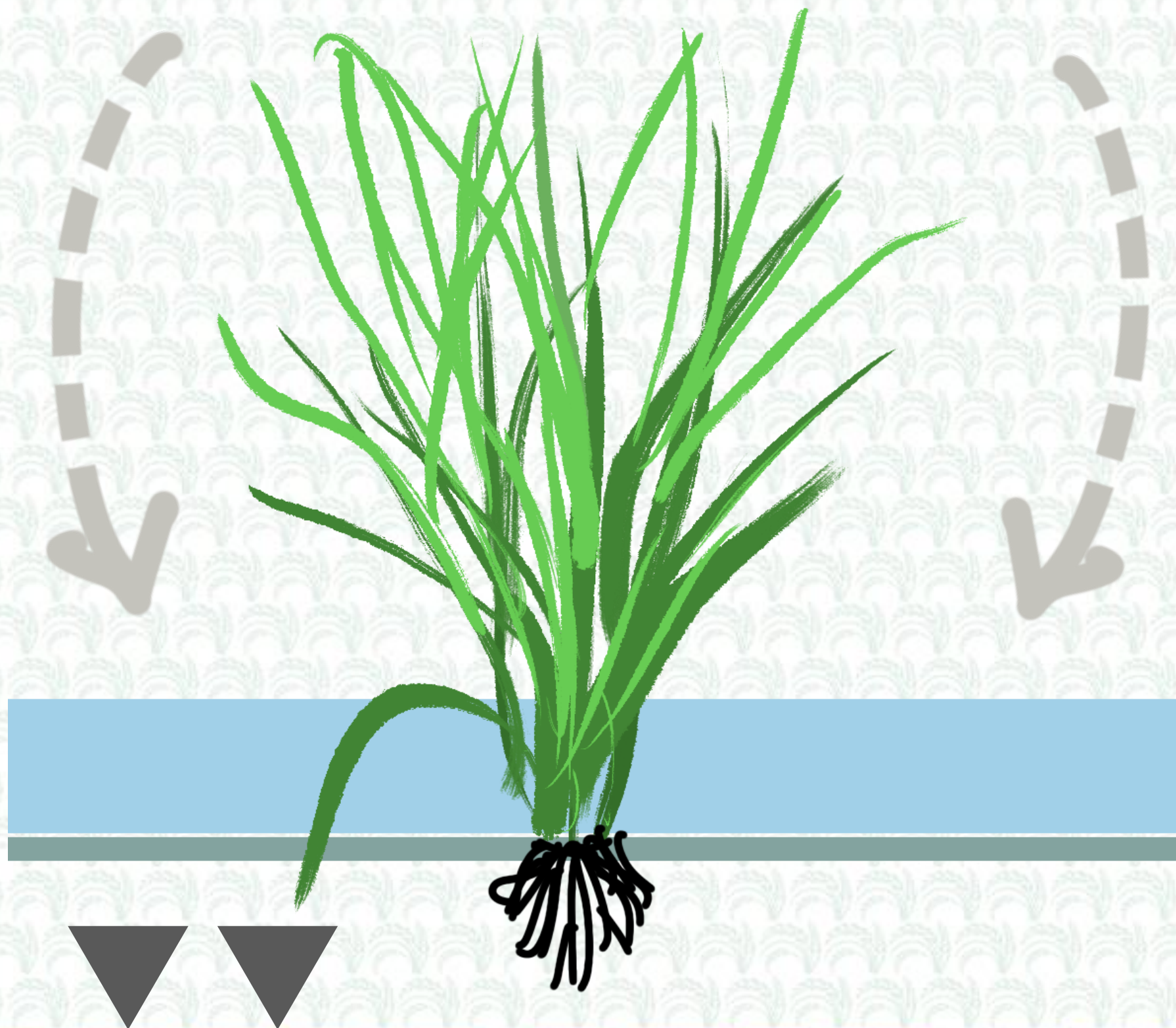
Replant at damaged hills within 7 days of transplanting.



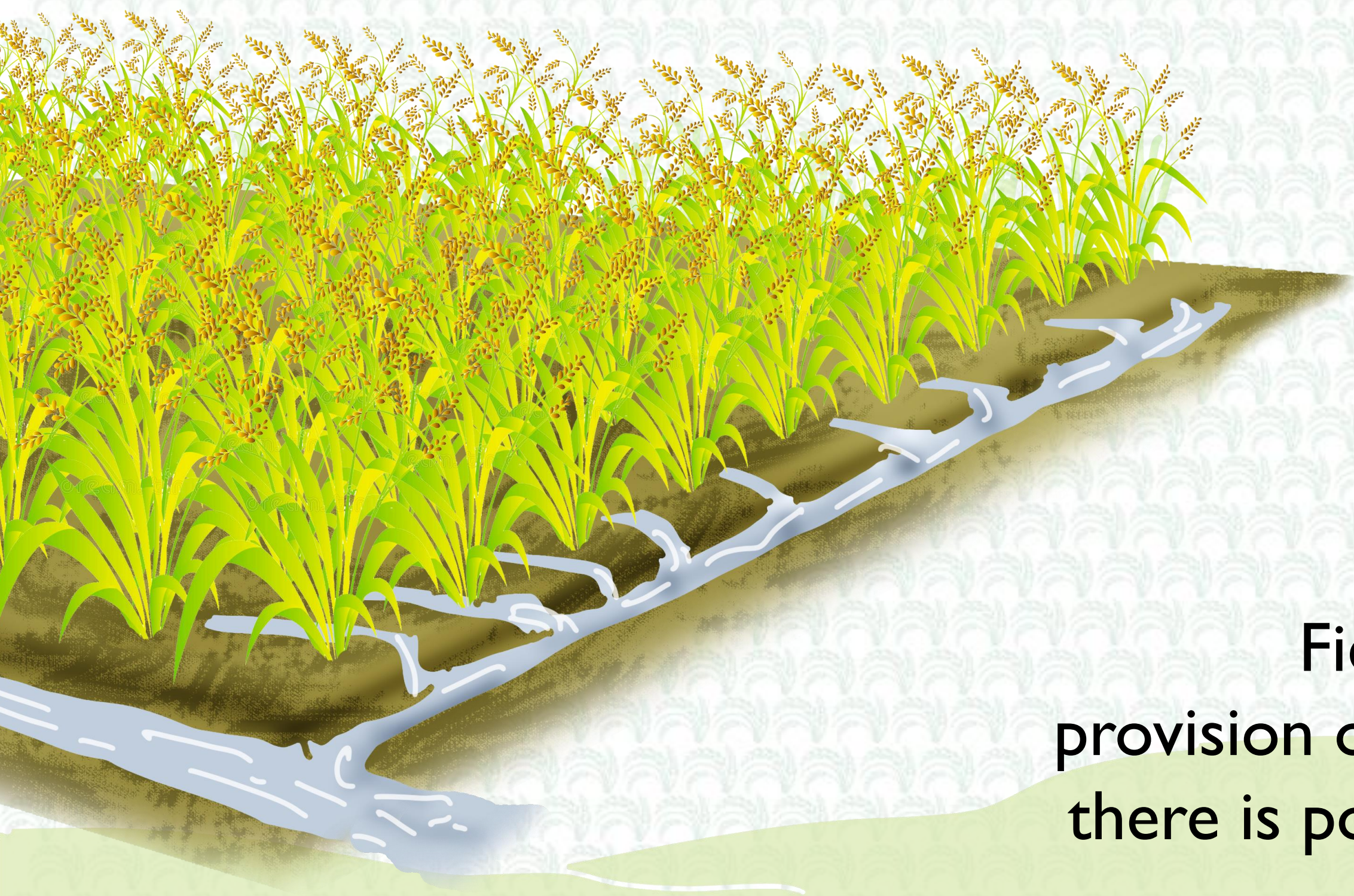
There should be enough water for 10-20 days after transplanting.



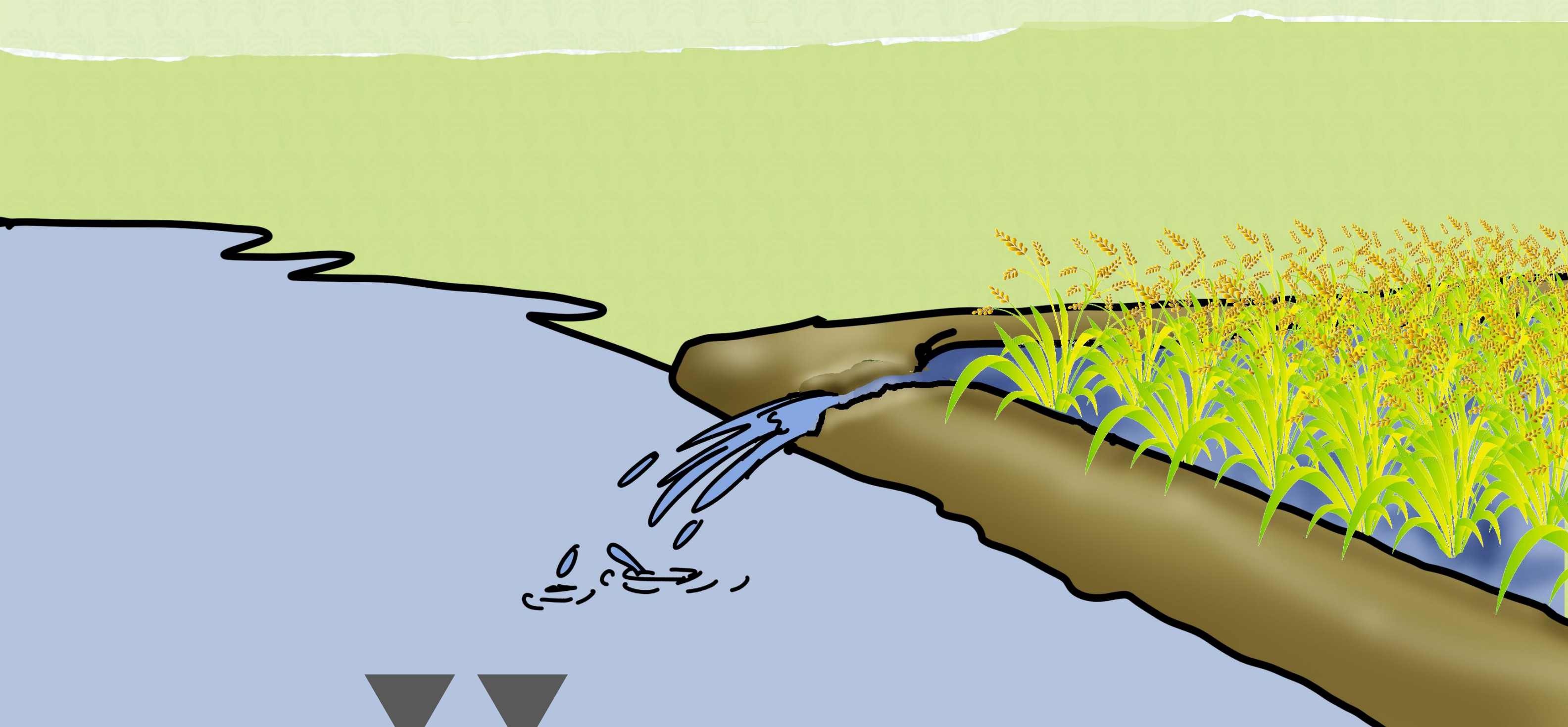
Keep field flooded from 1 week before to 1 week after flowering.



Field should be irrigated two weeks before harvesting for uniform maturity.



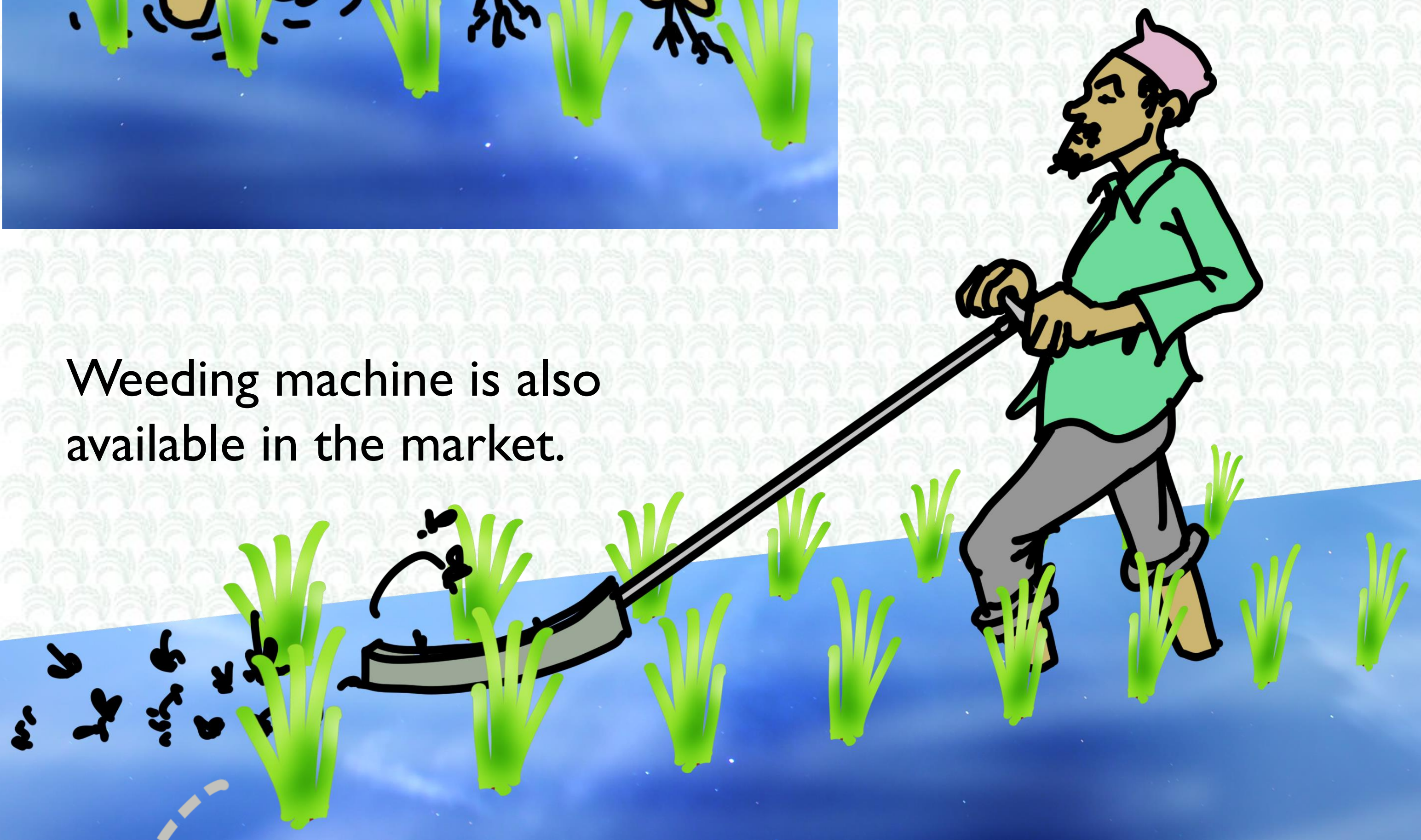
Field should have a provision of well drainage if there is possibility of heavy rain or flooding.



Generally weeding is done by hand



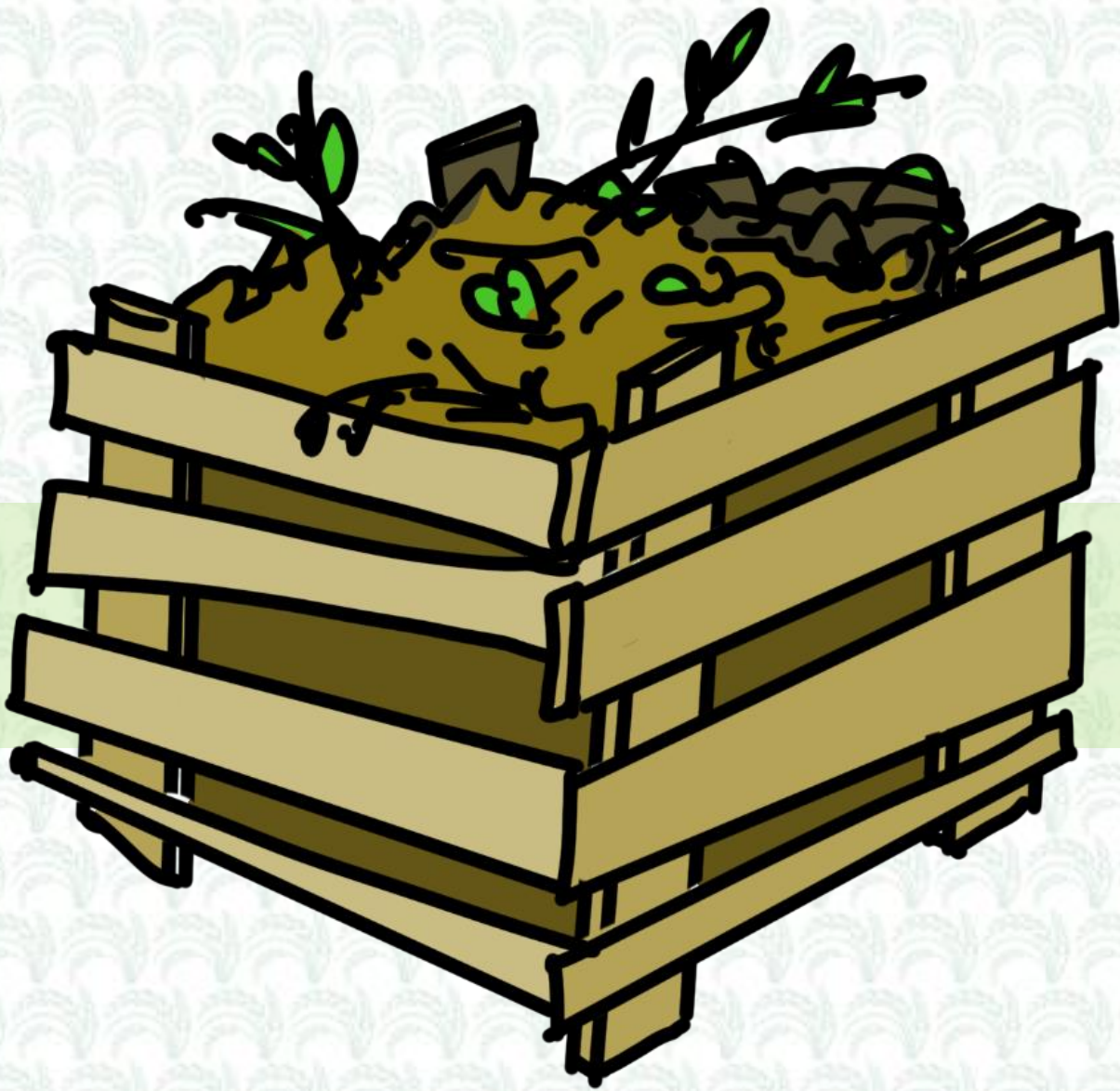
Weeding machine is also available in the market.



Very small weeds can be incorporated into the soil.

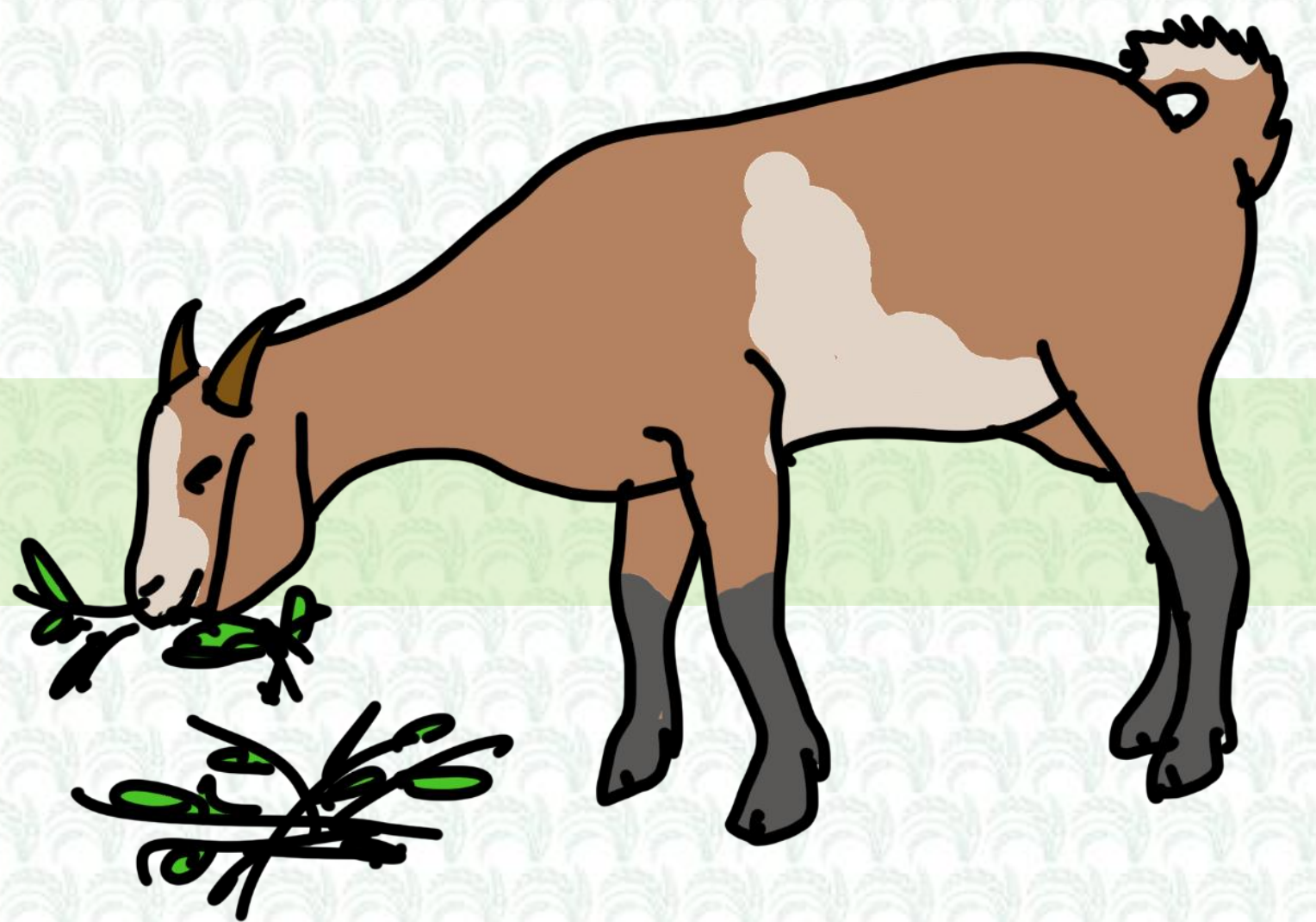


Weeds can be used in



COMPOSTING

AND ANIMAL FORAGE



Weeding is done at **2-3 WEEKS AND 5-6 WEEKS** after transplanting.



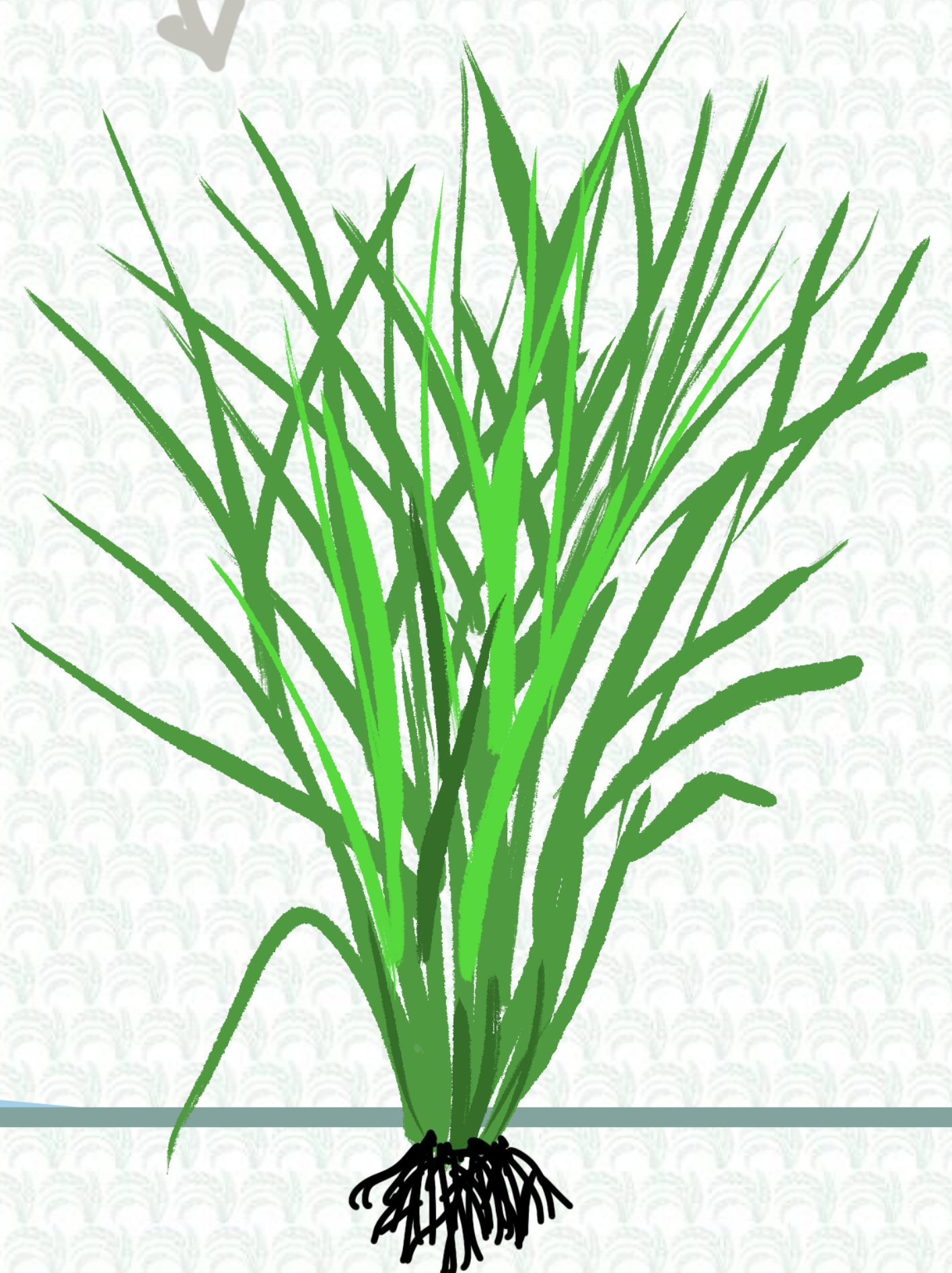
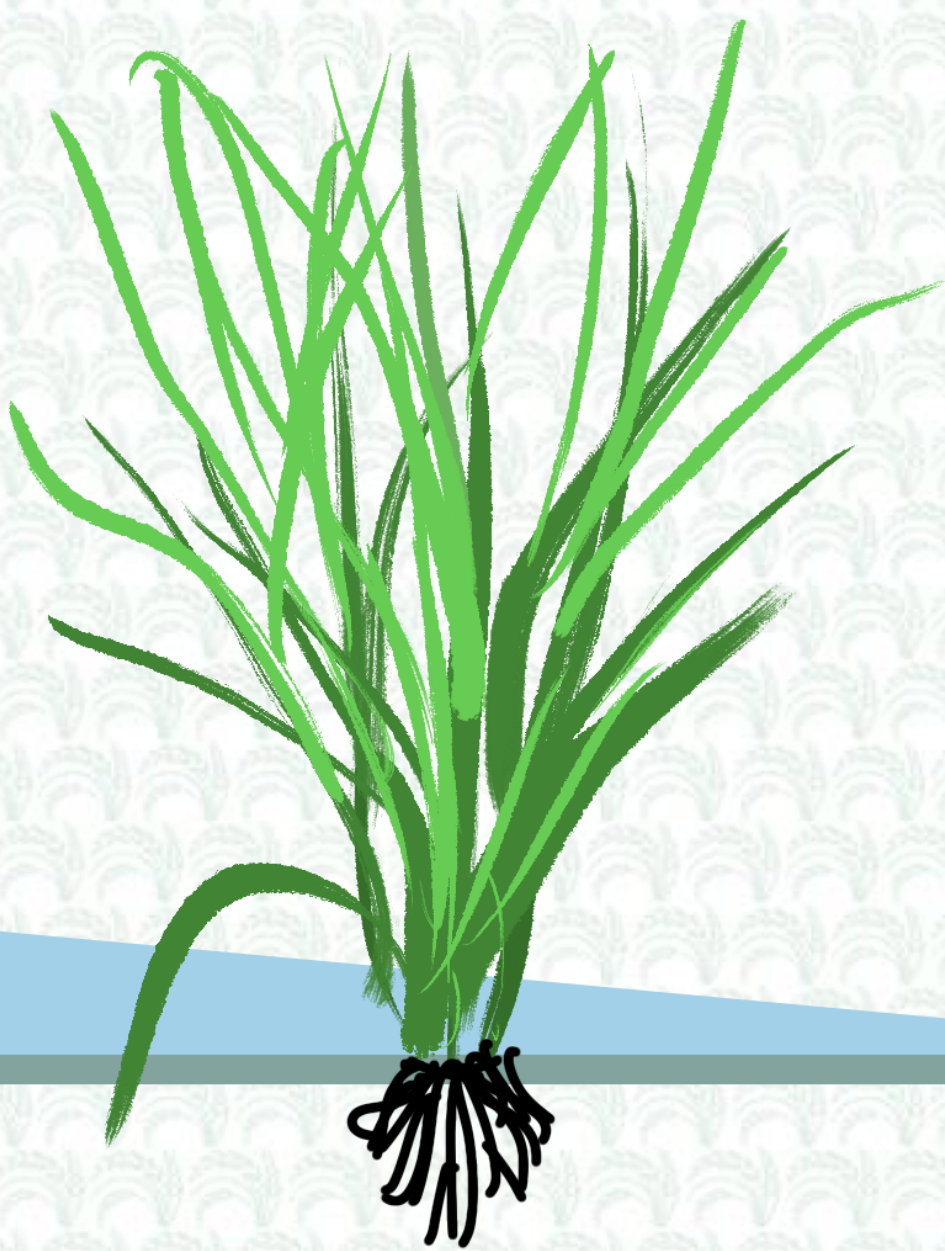
Urea is top-dressed in two stages:

FIRST

at tillering stage
(21 days)

SECOND

at panicle
initiation stage
(50 days)



TOPDRESSING

11

3.2kg and 3.2kg urea per kattha is applied at first and second topdressing respectively

Uniformly broadcasted by hand



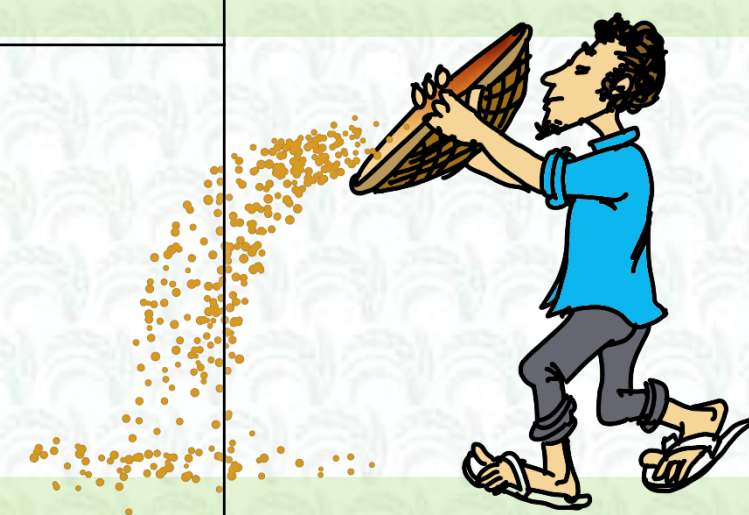
Spreader is also available for quick and uniform application



Fertilizers	Quantity (kg/kattha)	Remarks
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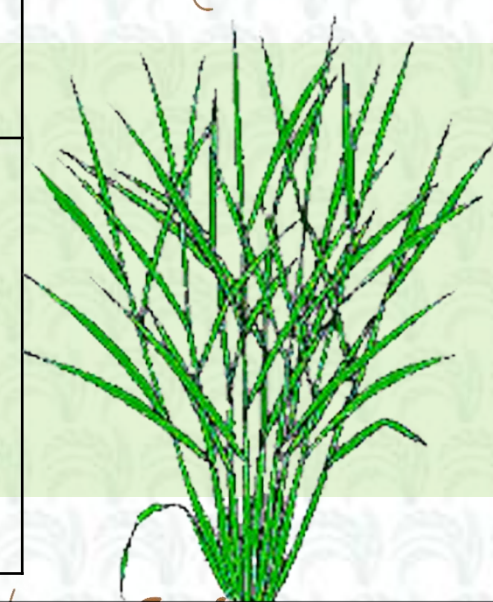
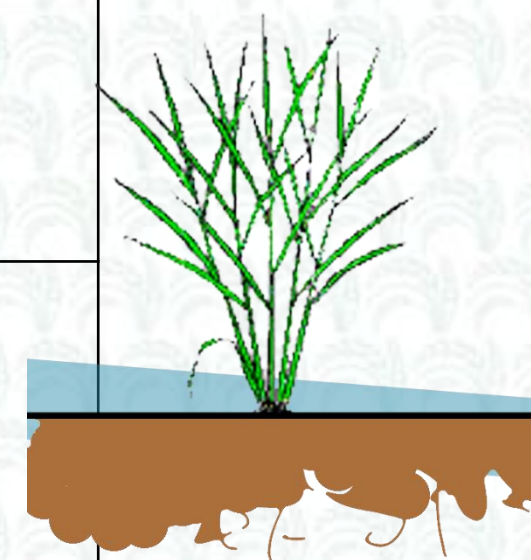
PLANTING FERTILIZERS

Compost/ FYM	300-500	At least 15 days prior to transplanting
DAP	2.1	Just before transplanting
MOP	1.7	Just before transplanting



TOP-DRESS FERTILIZER

1 st top dress urea	3.2	At tillering stage
2 nd top dress urea	3.2	At panicle initiation stage





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INTEGRATED SOIL FERTILITY MANAGEMENT

PART THREE
HARVESTING



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IFDC
Developing Agriculture from the Ground Up

CIMMYT
International Maize and Wheat Improvement Center

HARVESTING

Harvest about 30 days after
flowering



80-85% of the grains
are straw colored.

Grains in the lower
part of the panicle
are hard, not soft.



Harvesting is done 5-8cm above soil surface.

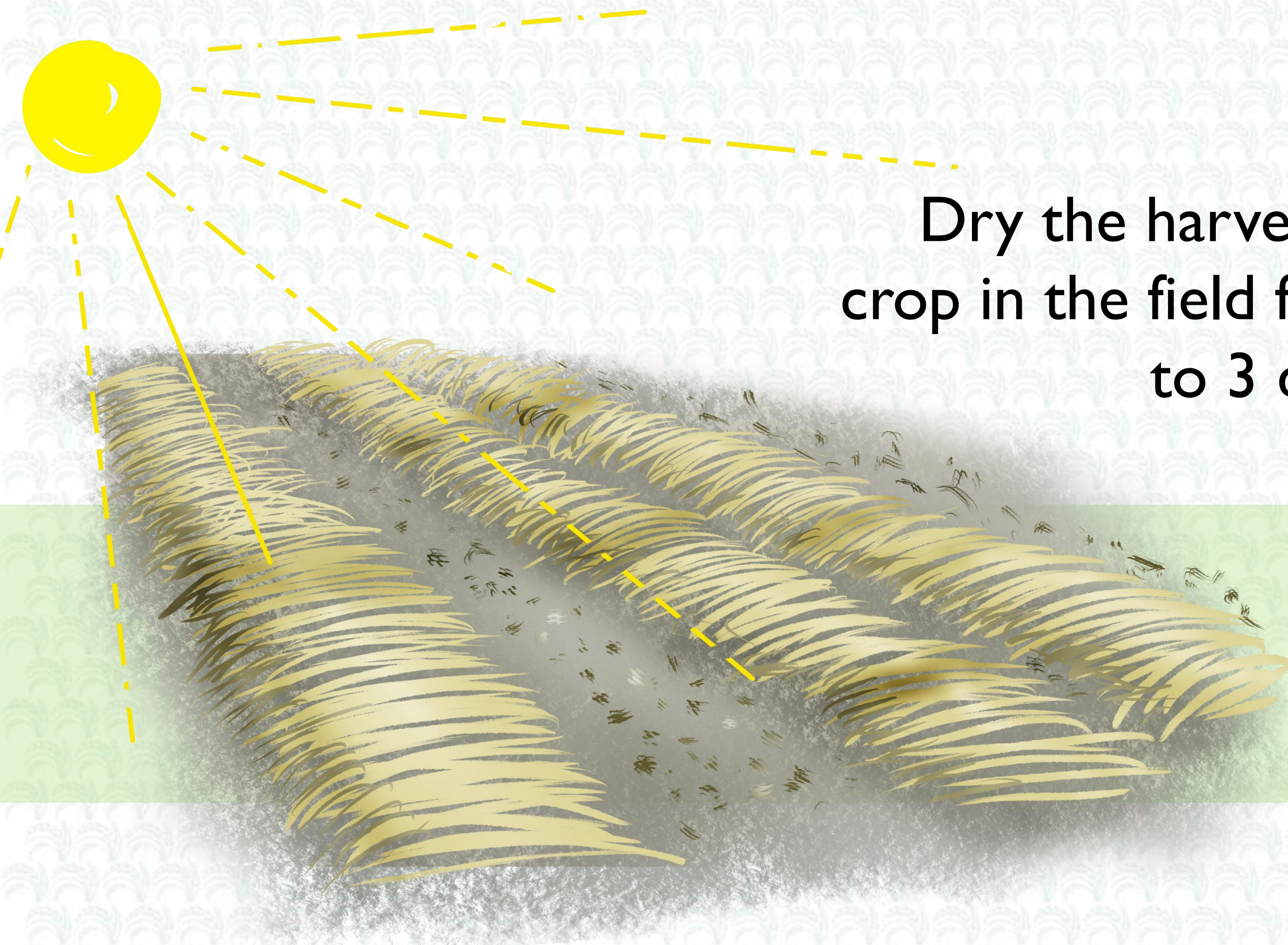


Crop residue is incorporated back into the soil to increase fertility.



Hand held machines for harvesting are also available in the market.





Dry the harvested crop in the field for 2 to 3 days.

Threshing should be done as soon as the harvested crop is dried.



Cleaning and drying is important before storage to maintain physical purity and minimizes insect infestation.



Store in clean, safe and dry place in sealed bins or bags.