Grade 4 Agriculture and Nutrition

Terms 1, 2 and 3 - notes for 13 topics

IN EVERY TOPIC

- What you will learn and the key words.
- Short, clear notes with worked examples.
- Questions to try and a topic test, with the answers at the back.

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Strand 1.0 Conservation of Resources | Term 1

1.1 Soil Conservation

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify suitable materials for making compost manure
- prepare compost manure for farming using the heap method
- make use of prepared compost in a crop garden

KEY WORDS

compost, manure, organic waste, decompose, heap method.

1. What is compost and why soil needs it

Compost manure

Compost is manure made by letting plant and kitchen waste rot (decompose) into a dark, crumbly material full of nutrients that plants need to grow well.

Soil that is used for growing crops year after year loses its nutrients over time; adding compost puts nutrients back and also helps the soil hold water better.

2. Materials suitable for compost

Suitable compost materials

Good compost materials include: dry plant matter (maize stalks, dry leaves, straw), green plant matter (fresh grass, weeds, vegetable peelings), and animal manure.

A mix of dry and green materials decomposes best - too much of only one type breaks down slowly or smells badly.

3. Materials to avoid in a compost heap

Materials to avoid

Avoid adding: meat and bones (attract pests and smell badly), diseased plant material (can spread disease to new crops), and any plastic, glass or metal (these never decompose).

Keeping these out keeps the compost heap safe, clean, and genuinely useful.

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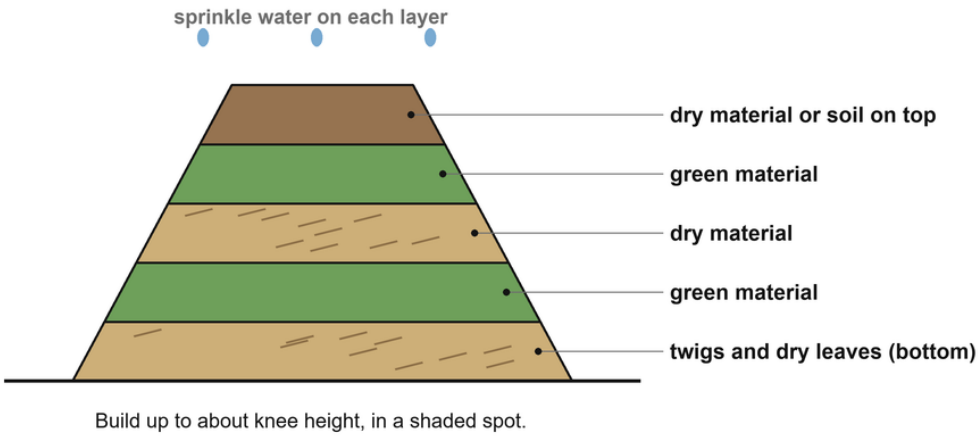
4. Building a compost heap

Practical: building a compost heap

Materials: dry and green plant material, water, a garden fork; groups of four or five.

Steps: 1) Choose a shaded, well-drained spot. 2) Lay a bottom layer of dry material (twigs, dry leaves). 3) Add a layer of green material. 4) Sprinkle a little water to moisten (not soak) the layers. 5) Repeat the layers until the heap is about knee height. 6) Cover the top with a final layer of dry material or soil.

Leave the heap to start decomposing; it will need turning and care over the following weeks (see the next lesson).



The layers of a compost heap

5. Turning and caring for the compost heap

Caring for a compost heap

Materials: a garden fork; groups.

A compost heap needs occasional turning (mixing the layers with a fork) every one to two weeks, which lets air reach the middle of the heap and helps materials break down evenly and faster.

It also needs occasional watering if it becomes too dry, and should stay covered to avoid getting too wet during heavy rain.

6. Using finished compost in a garden

Practical: using finished compost

Materials: finished or nearly-finished compost, a garden bed or container; groups.

Finished compost is dark, crumbly, and smells earthy (not rotten). Mix it into the top layer of soil in a garden bed or container before planting, or spread it around existing growing plants.

Compost improves the soil for the crop being planted, giving it a better chance to grow well.

7. Why composting matters for the environment

Composting and the environment

Composting reduces waste that would otherwise be burned (causing smoke and pollution) or dumped (attracting pests and taking up space), while also reducing the need for chemical fertilisers, which can be expensive and can harm soil life if overused.

It is a simple, low-cost way for any farmer or family to improve their soil while reducing waste.

TRY THESE

1. What is compost?
2. Why does farm soil need compost added to it over time?
3. Name two dry materials suitable for compost.
4. Name two green materials suitable for compost.
5. Why should meat and bones be kept out of a compost heap?
6. Why should diseased plant material be kept out?
7. What is the first layer of a compost heap usually made of?
8. Why is a little water added to the layers?
9. How often should a compost heap typically be turned?
10. Why does turning the heap help it decompose faster?
11. How can you tell compost is ready to use?

12. Name one way finished compost can be used in a garden.
13. Give one environmental benefit of composting instead of burning waste.
14. Give one environmental benefit of composting instead of dumping waste.

TOPIC TEST

T1. Why might a farmer prefer compost to throwing waste away?
T2. Why should you always mix dry and green materials rather than using only green (fresh) material?
T3. A neighbour wants to compost meat scraps to "not waste them". What would you advise, and why?
T4. Why might a compost heap built entirely from only dry material take much longer to decompose?
T5. If a compost heap is never turned at all, what problems might it develop?
T6. Why might a farmer who uses compost regularly need to buy less chemical fertiliser?
T7. Design a simple poster message to convince a household to start composting instead of burning their plant waste.

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Strand 1.0 Conservation of Resources | Term 1

1.2 Water Conservation

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- describe drip irrigation as a way of conserving water
- carry out drip irrigation to conserve water

KEY WORDS

irrigation, drip irrigation, conserve, container, nozzle.

1. What is drip irrigation

Drip irrigation

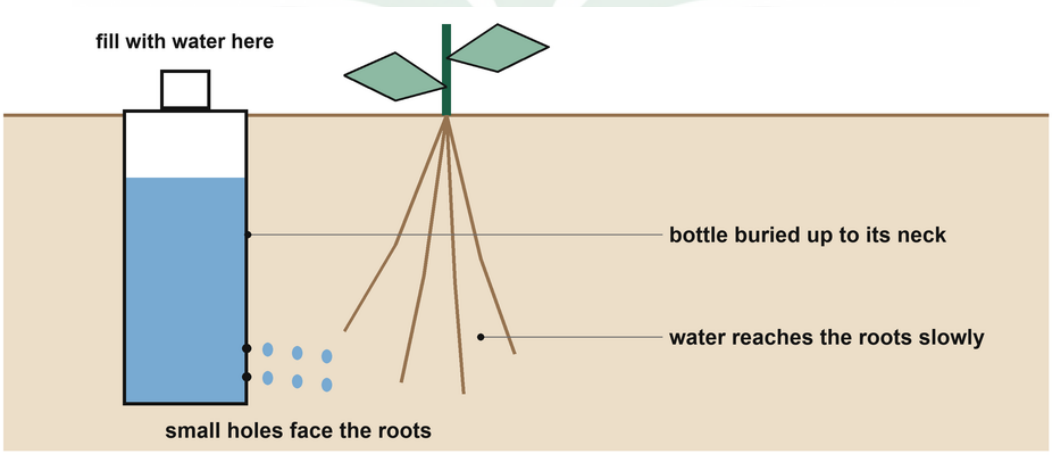
Drip irrigation is a way of watering crops where water drips slowly, drop by drop, straight to the roots of each plant, instead of being poured or sprayed over a wide area.

Because the water goes exactly where it is needed, very little is wasted through running off or evaporating in the sun.

2. How a simple drip irrigation system works

A simple drip system

A simple, improvised drip irrigation system can be made from a plastic bottle: small holes are made near the base, the bottle is buried (or placed) next to a plant's roots, and it is filled with water, which then drips out slowly over time. More advanced systems use pipes with small nozzles that release water drop by drop along a row of crops.



A bottle drip irrigation system

3. Making a simple drip irrigation container

Practical: an innovated drip irrigation bottle

Materials: a plastic bottle, a sharp object for holes - used carefully under supervision; groups of four.

Steps: 1) Take a clean plastic bottle. 2) With care and supervision, make 2-4 very small holes near the base of the bottle. 3) Dig a small hole in the soil next to a plant. 4) Bury the bottle up to its neck, holes facing the plant's roots. 5) Fill the bottle with water through the top opening.

The water will slowly drip out through the small holes, straight to the roots, over several hours.

4. Using drip irrigation in gardening

Practical: watering and observing

Materials: the drip irrigation bottle made earlier, a garden bed or potted plant; groups.

Set up your drip irrigation bottle next to a real growing plant. Refill it with water every few days, and observe and record how the plant and the soil around it look over one to two weeks.

Compare it, if possible, to a nearby plant watered the normal way (poured over the top), to see any difference in soil moisture or water use.

5. Advantages of drip irrigation over other watering methods

Comparing watering methods

Watering by pouring or spraying widely can waste water on bare soil between plants, cause some water to run off the surface, and lose water to evaporation in the sun.

Drip irrigation avoids most of this waste because it delivers water slowly and directly to where the roots actually are.

6. Drip irrigation and conserving water in the community

Drip irrigation and the community

When farmers waste less water, more remains available for drinking, other households, and other farms in the same area, especially important where water is scarce or must be fetched or bought.

Conserving water this way also protects water sources like rivers, wells and boreholes from running dry too quickly.

7. Sharing what we learned about drip irrigation

Practical: presenting our findings

Materials: manila paper, the observation logs from earlier lessons; groups.

In groups, prepare a short presentation using your earlier observation log: describe how you built your drip irrigation container, what you observed over the days you used it, and why drip irrigation conserves water.

Present to another group or the class.

TRY THESE

1. What is drip irrigation?
2. Why does drip irrigation waste less water than pouring or spraying?
3. What simple household item can be used to make a drip irrigation container?
4. Where are the small holes made on the bottle?
5. How many small holes are typically made near the base of the bottle?
6. Where is the bottle buried?
7. How often should the bottle be refilled?
8. What should learners observe and record over the following week or two?
9. Give one disadvantage of watering by spraying widely over an area.
10. Give one advantage of drip irrigation over spraying widely.
11. How does one farmer conserving water benefit others in the community?
12. Give one water source that could be protected by widespread water conservation.
13. Describe how your group built its drip irrigation container.
14. What did your group observe over the days you used it?

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TOPIC TEST

T1. Why might drip irrigation be especially useful in an area that does not get much rain?

T2. Why might it be a good idea to make the holes in the bottle very small, rather than large?

T3. If the water in your bottle drains out too quickly, what might you change about the holes next time?

T4. If two plants received the same total amount of water, but one via drip irrigation and one poured all at once, which do you predict would use the water more efficiently, and why?

T5. Suggest one situation where wide watering (pouring or spraying) might still be more practical than drip irrigation.

T6. Suggest one other everyday way (not farming) that your own family could conserve water at home.

T7. If your school wanted to set up permanent drip irrigation for its own garden, what would be the first step?

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