Plant Processes

SLO: To become familiar with the three Plant processes that **EXPLAIN** why something is so important for good plant growth and therefore animal production.

Why Any questions in the examinations where they mention **Plant processes**, **plant growth** or **crop growth**, then they mean these three functions.

Use must use one or more of these functions as part of your answer.

They are

Photosynthesis

Transpiration

Respiration

1) Photosynthesis

Copy and complete the following.

Photosynthesis in plants is the process that plants use to make food ie glucose, starch and cellulose.

The reaction itself is.

+ Light

Water + Nutrients + CO2 Sugar

The water and nutrients come from the soil.

The CO2 from the air and the light from the sun !

The first factor to run out (usually CO2 ) will stop the reaction. However at night, photosynthesis will always stop because of the lack of light.

Qu 1. What soil factors would have the greatest effect on the photosynthesis rate ?

Soil water, soil pH, soil air, soil temperature and nutrients.

Qu 2 Why ?

All these control how fast photosynthesis occurs.

Qu 3 What could a farmer do, to increase the rate of photosynthesis ?

Add these ingredients ie irrigation, lime, aerate, drain and fertiliser.

2. Transpiration

Transpiration is the movement of water ( + dissolved nutrients) into the roots, up the stem into the leaves. Here some of it (about 10%) is used in photosynthesis, the rest ie evaporated.

Qu 1. How much water can a large tree use in an hour ?

Up to 450 l per hour.

Qu 2. What soil factors would have the greatest effect on the transpiration rate ?

Soil water, soil air, climate (wind and warmth).

Qu 3. Why ?

Water and air is needed by the roots. Warm, windy conditions make it easier for the plant to lose water.

Qu 4. What could a farmer do, to control the rate of transpiration ?

Water - use irrigation or drainage.

Air - aerate

Wind - use shelter

Warmth - glasshouse or add Organic matter.

3. **Respiration**

Respiration is the process where food is turned into energy and CO2. All cells respire to make the energy needed for the plant or animal to live, grow etc. Especially the plant roots, worms, soil bacteria etc..

O2 + food energy + CO2.

Qu 1. What soil factors would have the greatest effect on the respiration rate ?

Soil water, soil air, soil temperature.

Qu 2. Why ?

Respiration needs oxygen. If the soil has little air, the plant roots and soil animals cannot survive. Higher temperatures mean faster reactions.

Qu 3. What could a farmer do, to encourage plant respiration ?

Introduce air into a soil ie cultivation, an aerator, drainage etc