OCR (B) Biology A-level

Topic 4.4 - From Flowers to Food

Definitions and Concepts

4.4.1 Plant reproduction

Aleurone layer - The protein-rich outermost layer of the endosperm that serves as an important enzyme store.

Anther - The pollen-bearing structure of the stamen.

Carpel - The female part of the plant consisting of a stigma, a style and an ovary.

Cotyledons - Embryonic seed leaves that emerge following germination.

Cross-pollination - A type of pollination in which pollen is transferred from an anther of one plant to a stigma of a different plant. This results in plants with greater genetic diversity.

Dehiscence - The splitting of the anther resulting in the release of pollen grains.

Dicotyledons - Plants that produce seeds that contain two cotyledons; they have two primary leaves.

Double fertilisation - Fertilisation of seed plants in which one male gamete fuses with a female gamete to form a diploid zygote and another fuses with two polar nuclei to form a triploid endosperm nucleus.

Endosperm - The food source surrounding the plant embryo.

Endospermic seed - A seed that contains an endosperm when mature, e.g. maize.

Florigen - A hormone which promotes flowering in the presence of Pfr**.**

Germination - The process by which a plant grows from a seed.

Gibberellin - A plant hormone which, during germination, induces the synthesis of amylase by aleurone cells, hydrolysing stored nutrients in the endosperm.

Insect-pollinated flower - A type of flower that relies on insects to transfer pollen grains between flowers.

Micropyle - A pore in the integument of an ovule through which the pollen tube enters the embryo sac. It remains as a pore in the testa.

Non-endospermic seed - A seed that does not contain an endosperm when mature, e.g. broad bean. Cotyledons serve as the food source.

Ovary - Part of the carpel that holds the ovules and, following fertilisation, develops into the fruit.

Ovule - The part of the ovary that gives rise to and contains the female germ cell. After fertilisation, the ovule becomes the seed.

Petals - Structures that surround the reproductive parts of a flower. They are often brightly coloured and fragrant to attract insects.

Phytochrome - A plant photoreceptor with a bilin chromophore group which converts between the inactive Pr form and the active Pfr form. Pr absorbs red light and Pfr absorbs far-red light.

Plumule - The part of a plant embryo that develops into the primary shoot.

Pollen grain - A single granule of pollen that contains the male haploid gamete. Grains are small and produced in large numbers in wind-pollinated plants, whereas they are large and sticky in insect-pollinated plants.

Pollen tube - A hollow tube that grows from a pollen grain to the embryo sac in the ovule after pollination. It delivers two male gametes.

Pollination - The deposition of pollen onto a stigma from an anther.

Radicle - The part of a plant embryo that develops into the root.

Self-pollination - A type of pollination in which pollen is transferred from an anther of a plant to a stigma of the same plant. This results in plants with less genetic diversity.

Stamen - The male part of the plant consisting of an anther and a filament that is involved in the production of male gametes in the form of pollen grains.

Staple food - A basic nutrient source consumed daily by a population.

Stigma - The sticky structure of the carpel that receives pollen grains.

Tapetum - A specialised layer of cells within the anther that provide nutrients to developing pollen grains.

Testa - The outer covering of a seed, commonly referred to as the seed coat.

Vernalisation - In some plants, an extended period of exposure to cold temperatures promotes the transcription of genes involved in flowering.

Wind-pollinated flower - A type of flower that relies on wind to transfer pollen grains between flowers.