Radishes with different amounts of fertiliser Technician notes

Introduction

This practical is taken from a series of activities produced by Science and Plants for Schools (SAPS), based on work by John Hewitson and Richard Price. The original practical worksheet and publication, *Plant mineral nutrition in the classroom: the radish, Raphanus sativus L is a good plant for such studies* (School Science Review, September 1994, ASE), can both be found on the SAPS website, http://www-saps.plantsci.cam.ac.uk, together with many additional suggested activity worksheets. It is recommended that you view the following source documents in preparation for this practical activity.

http://www-saps.plantsci.cam.ac.uk/worksheets/radish.htm
http://www.saps.plantsci.cam.ac.uk/worksheets.project4.htm
http://www-saps.plantsci.cam.ac.uk/pdfs/hp.pdf

Requirements (for each group)

In order to ensure that the class has sufficient repeated data for each value, each group is instructed to carry out the full experiment. Data should be pooled to obtain average results.

5 black film cans with a 0.5cm diameter hole in the base (a heated screwdriver can be used to form the hole)
Fine capillary matting to form the wick
Growing mixture of peat:vermiculite in a 1:1 ratio
A marker pen
5 label sticks
10 radish seeds
30 N:P:K slow release fertiliser pellets (equal parts N:P:K) available from garden centres

Requirements (for the class as a whole)

Reservoirs to support and water the cans. For example, a large ice cream tub lid covered with capillary matting turned upside down and sideways, supported on its original tub. The capillary matting should extend into the tub containing a reservoir of water, ensuring that the plants remain moist without the need for pupils to regularly water the cans. Ideally the reservoirs should hold distilled water, although this is not essential.

After the first two days when seeds are left to become established, continuous illumination should be provided for the plants. Ideally this would be produced from fluorescent tubes held 15cm above the top leaves.

Safety

- Care should be taken when using scalpels.
- Cutting should be done on white tiles.
- Cuts should be covered when handling growing mixture, and hands washed afterwards.
- Pupils should be warned about the heat danger from light banks.
- Care should be taken when making the hole in the film cans, which should be done in a well ventilated room. A cork borer may also be used.

Alternatives to fertiliser pellets

It is possible to provide the plants with varying concentrations of nitrate solutions rather than using fertiliser pellets. A very detailed account of this procedure is given in Hewitson, J. and Price, R. *Plant mineral nutrition in the classroom: the radish, Raphanus sativus L is a good plant for such studies* (School Science Review, September 1994, ASE). This article can be downloaded in pdf format from the SAPS website at http://www-saps.plantsci.cam.ac.uk/pdfs/hp.pdf