

AS Level Biology A
H020/02 Depth in biology

Question Set 18

1. The sweet potato is a plant that is a staple food in countries such as China. The sweet potato is susceptible to a group of viruses known as potyviruses.

(a) (i) It is difficult for the virus to enter the sweet potato cell.

Suggest a barrier that makes it difficult for potyviruses to enter the sweet potato cell. **Cellulose cell wall** [1]

(ii) Suggest how the potyviruses enter the sweet potato cell. [1]

Enter via a vector e.g. viral particles transmitted through stylet of aphid injected into the phloem during feeding.

(b) Sweet potato cells have a mechanism that recognises and destroys incorrectly formed mRNA or non-functional mRNA.

(i) The nucleic acid in potyviruses is RNA.

Suggest why this mechanism in sweet potato cells is able to counteract infection by a potyvirus. [2]

The mechanism will identify potyvirus RNA as foreign or 'incorrect' and destroy it, preventing translation and viral replication.

(ii) An enzyme is involved in this process.

Name the bond that is broken by this enzyme. [1]

Phosphodiester bond

(iii) Suggest an advantage to a non-infected cell of having this process. [2]

Incorrect or faulty mRNA will be destroyed before it can be translated. This prevents defects in protein synthesis and the production of faulty proteins with altered primary structures, which could otherwise lead to a range of harmful effects.

Total Marks for Question Set 18: 7

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