

**M1.** (a) to kill virus  
**or**  
to prevent virus spreading 1

(b) take (stem) cells from meristem  
**or**  
tissue culture  
*allow take cuttings* 1

(c) use Benedict's solution 1

glucoses turns solution blue to orange 1

(d) **Level 2 (3–4 marks):**  
A detailed and coherent explanation is provided. The student makes logical links between clearly identified, relevant points that explain why plants with TMV have stunted growth.

**Level 1 (1–2 marks):**  
Simple statements are made, but not precisely. The logic is unclear.

**0 marks:**  
No relevant content.

**Indicative content**

- less photosynthesis because of lack of chlorophyll
- therefore less glucose made  
so
- less energy released for growth
- because glucose is needed for respiration  
and / or
- therefore less amino acids / proteins / cellulose for growth
- because glucose is needed for making amino acids / proteins / cellulose

4

[8]

- M2.** (a) *idea:*  
 wood goodness recycled/crops goodness removed  
*gains 1 mark* 1
- but**  
 wood minerals/nutrients recycled/crops remove nutrients/minerals  
*gains 2 marks*
- wood and crops compared  
*for 1 mark* 2
- (b) (add) fertiliser/nutrients/minerals  
 (add) manure/animal waste/compost  
*any two for 1 mark each*
- (accept move to new area for 1 mark)  
 rotation  
*max marks 2* 2

[5]

**M3.** use less nitrate / fertiliser  
*accept use none*  
*use a different fertiliser is neutral*  
*prevent nitrate fertiliser run off is neutral*

1

any **two** from:

explanation that with less or none the crops still grow

make more land available to grow more crops

monitoring of water

legislation

organic farming / manure

genetically modified crops

give babies bottled water

2

[3]

**M4.** (a) less carbon dioxide used  
or higher carbon dioxide (concentration) in jar  
*do **not** allow no carbon dioxide used or no change in carbon dioxide*

1

because less photosynthesis **or** light was a limiting factor  
*do **not** allow no photosynthesis*

1

(b) magnesium / Mg  
*do **not** allow manganese / Mn  
allow iron / Fe  
ignore nitrates*

1

[3]

- M5.** (a) **A** 1
- (b) **D** 1
- (c) use the same type of plant  
**or**  
give equal amount of water to each plant  
*ignore size of pot* 1
- (d) (advantage) more minerals 1
- (disadvantage) cost / not free 1
- [5]**