Including examiner comments

R3104

UNDERSTANDING APPLIED PLANT PROPAGATION

Level 3

Wednesday 26 June 2019

15:55 – 16:45

Written Examination

Candidate Number:……

Candidate Name:……

Centre Number/Name:……

IMPORTANT – Please read carefully before commencing:

i) The duration of this paper is **50** minutes;

ii) **ALL** questions should be attempted;

iii) **EACH** question carries **10 marks**;

iv) Write your answers legibly in the spaces provided. It is **NOT** necessary that all lined space is used in answering the questions;

v) Use **METRIC** measurements only;

vi) Use black or blue ink only. Pencil may be used for drawing purposes only;

vii) Where plant names are required, they should include genus, species and where appropriate, cultivar;

viii) Where a question requires a specific number of answers; only the first answers given that meet the question requirement will be accepted, regardless of the number of answers offered;

ix) Please note, when the word **'distinct'** is used within a question, it means that the items have different characteristics or features.

Ofqual Unit Code J/505/8534

Please turn over/…..

ANSWER ALL QUESTIONS

MARKS

Q1 Explain how **EACH** of the following techniques can encourage successful vegetative propagation:

i) mist propagation; **6**
ii) hot pipe callusing. **4**

Please see over/…..

MARKS

Total Mark

Please turn over/…..

MARKS

Q2 a) Describe the production of a bush rose under **EACH** of the following headings:

i) rootstock selection; **2**
ii) budding technique; **5**
iii) aftercare. **3**

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Please see over/…..

MARKS

Total Mark

Please turn over/…..

MARKS

Q3 Describe the following seed treatments giving a **NAMED** seed example for **EACH**:

i) priming; **5**
ii) pelleting. **5**

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MARKS

Total Mark

Please turn over/…..

MARKS

Q4 a) Define the term ‘seed stratification’. **3**

b) List **FOUR** distinct facilities/items of equipment required for stratification. **4**

Please see over/…..

c) Describe the seed dormancy mechanism in **ONE NAMED** plant which can be broken by stratification.

MARKS

3

Total Mark

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**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB.
Charity Registration Number: 222879/SC038262**

Including examiner comments

R3104

UNDERSTANDING APPLIED PLANT PROPAGATION

Level 3

Wednesday 26 June 2019

Candidates Registered	**114**		**Total Candidates Passed**	**80**	**84%**
Candidates Entered	95	83%	Passed with Commendation	37	39%
Candidates Absent/Withdrawn	18	16%	Passed	43	45%
Candidates Deferred	1	1%	Failed	15	16%

General comments

Candidates presented a good level of technical detail when answering most of the questions, however it is vital that candidates read the questions thoroughly before answering to differentiate between the instructions ‘explain’, ‘describe’, ‘define’ and ‘list’.

MARKS

Q1 Explain how **EACH** of the following techniques can encourage successful vegetative propagation:

i) mist propagation; **6**
ii) hot pipe callusing. **4**

In general, this question was not well answered and overall the marks were disappointingly low. Many candidates did not answer the question as required and answers lacked detail.

Q1 Mist propagation

i) Many candidates did not answer the question and discussed the science behind how cuttings root and provided descriptions of a mist unit which was not asked for. Candidates also stated that cuttings need cool tops and warm bottoms but did not link this to how mist propagation can encourage rooting.

Those candidates who specified the condition provided by the mist for example, the mist unit provides constant high atmospheric humidity and then explained how this impacted on rooting physiology scored appropriate marks.

Candidates described how misting reduces transpiration but most did not mention evaporative cooling. Some candidates described how the respiration rate could be lowered through evaporative cooling which was credited.

Candidates who did describe the need for basal heat and how it can be provided and the balance between water and oxygen in the propagation media to prevent waterlogging gained maximum marks.

ii) Hot pipe callusing

Most candidates described how the technique was used to achieve a high success rate of callusing of the graft union and that it is only the graft union that receives the heat.

Details of the location of the hot pipe was not described or how the heat is provided and how the graft union is placed in insulated slots in the pipe. Very few candidates described that the rootstock and the top of the scion require cool temperatures to remain dormant.

Some candidates wrongly described hot pipe callusing as being used for propagation other than grafting which is a concern as it is clearly an important part of the syllabus.

MARKS

Q2 a) Describe the production of a bush rose under **EACH** of the following headings:

i)	rootstock selection;	**2**
ii)	budding technique;	**5**
iii)	aftercare.	**3**

Q2

Overall this question was answered well with many candidates gaining high marks. Many of the candidates provided additional detail with reference to planting of the rootstocks, mounding the soil around the base of the rootstock, its removal prior to budding, when to collect the bud sticks etc. and wasted time. This meant that their descriptions of the technique of budding were less detailed.

i) Rootstock selection

Most candidates gave *Rosa* 'Laxa' as a suitable rootstock for a bush rose, others named *Rosa canina* which was also accepted. Rootstocks should also be disease and pest free.

Very few candidates described that the rootstock must be compatible with the scion and none of them stated that the rootstocks should be graded or gave an appropriate size for a rootstock suitable for budding.

ii) Budding technique

Nearly all candidates described the technique of 'T' budding with varying degrees of detail. Most candidates were able to gain high marks for this section of the question as there were so many points that could achieve marks.

Candidates were expected to provide the length of the cuts and where the cuts are made on the rootstock and similarly on the bud stick to extract the bud. Details were also given on how to open the flaps of the cuts, positioning of the bud behind the flaps to achieve cambium to cambium contact and covering the bud with a bud patch. Many candidates used diagrams to illustrate their answers.

iii) Aftercare

The majority of candidates included weeding, watering, pest and disease control and the application of fertiliser in their answers and gained marks.

The best candidates also included the timing and technique of heading back as well as the removal of the bud patch/tie if it had not already degraded

Q3 Describe the following seed treatments giving a **NAMED** seed example for **EACH**:

i) priming; **5**
ii) pelleting. **5**

Q3 Overall this question was fairly well answered with some candidates attaining high marks.

Most candidates understood the terms ‘Priming’ and ‘Pelleting’ but a few described stratification and scarification which was a concern.

i) Priming
Many candidates were able to name a suitable example of a seed that is treated by priming with most giving *Allium porrum.* High marks were gained by candidates who included; soaking of the seeds, imbibition and drying of the seeds prior to the emergence of the radicle. The best candidates also included descriptions of hydro-priming and osmotic priming in their answers.

ii) Pelleting
Most candidates described why seeds are pelleted i.e. for ease of handling and mechanical sowing. They also described what the seeds were coated with, i.e. an inert mineral matter such as clay, and that the coating may also include a protectant compound.

Very few candidates stated that pelleted seed was coloured to deter birds.

A suitable example of pelleted seed is *Begonia* Cultorum Group whereas many candidates gave *Begonia semperflorens* as an example which could not be awarded any marks.

Q4		MARKS
a)	Define the term ‘seed stratification’.	3
b)	List **FOUR** distinct facilities/items of equipment required for stratification.	4
c)	Describe the seed dormancy mechanism in **ONE NAMED** plant which can be broken by stratification.	3

Q4 Overall the question was well answered with many candidates achieving high marks. It is always a concern when a few candidates name and write about scarification when the question refers to stratification.

a) This was mostly well answered by candidates who stated that stratification mimics the conditions that occur naturally and that seeds require these conditions to break dormancy.

The best candidates also stated what conditions were required for stratification.

b) This section of the question enabled candidates to gain high marks although some of them expected marks for naming labels and pens! Most candidates listed; polythene bags or other containers, refrigerator, cold frame, moist media etc.

Although the question said list, many candidates wasted time by describing the facilities and equipment.

c) Most candidates were able to name a suitable example of a plant whose seed dormancy mechanism can be broken by stratification. The most common plant names given included; *Fraxinus excelsior* and *Crataegus monogyna.* Candidates who named the specific dormancy mechanism for the plant example given provided good descriptions of how to overcome it. For example, *Fraxinus excelsior* has multiple (deep) dormancy caused by an impermeable seed coat, immature embryo and germination inhibitors within the seed. The stratification treatment is moist stratification at 20°C for 2-3 months followed by cool stratification at 4°C for 4-7 months.

Many candidates lost marks as they did not name the specific dormancy mechanism for the plant example given.

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