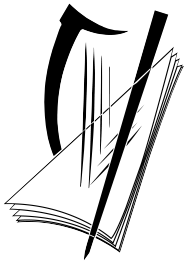

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2018

Marking Scheme

Agricultural Science

Higher Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

Introduction

General points

- The marking scheme is a guide to awarding marks.
- Examiners must conform to this scheme, and may not allow marks for answers outside the scheme.
- In many cases only key phrases are given in the marking scheme. These points contain the information and ideas that must appear in the candidate's answer in order to merit the assigned marks.
- The descriptions, methods and definitions given in the marking scheme are not exhaustive and alternative valid answers are acceptable.
- If an examiner determines that a candidate has presented a valid answer but there is no provision in the scheme for accepting that answer, then the examiner must first consult with his/ her advising examiner before awarding marks. In general, if an examiner is in any doubt whether a particular answer is correct they should consult their advising examiner before awarding marks.
- The detail required in any answer is determined by the context, the phrasing of the question, and by the number of marks assigned to the answer in the examination paper. This may vary from year to year.
- Words, expressions or statements separated by a solidus (/) are alternatives that are equally acceptable for a particular point. A word or phrase given in brackets is an acceptable alternative to the preceding word or phrase. Note, however, that words, expressions or phrases must be correctly used in context and not contradicted and where there is evidence of incorrect use or contradiction, the marks may not be awarded.
- In general, names and formulas of elements are equally acceptable. However, in some cases where the name is specifically asked for, the formula may be accepted as an alternative. This will be clarified within the scheme.

Cancelled answers

- If the only answer offered is cancelled ignore the cancelling and mark as usual.
- If an answer is cancelled and a second version of the answer is given, you should accept the cancellation and award marks, where merited, for the un-cancelled version only.

- If two un-cancelled versions of an answer are given to the same question or part of a question, mark both and accept the answer that yields the greater number of marks. You may not, however, combine points from both versions to arrive at a manufactured total.

Conventions

- The mark awarded for an answer appears in the marking scheme next to the answer on the right hand side.

- Where there are several parts in the answer to a question, the mark awarded for each part appears as e.g. **3(4)**. This means there are three parts to the answer, each part allocated 4 marks.

- Award unit marks separately e.g. if an answer merits three 3-mark units, write three separate '3's, under each other, in the first column in the right-hand margin of the answer book.

- The answers to subsections of a question may not necessarily be tied to a specific mark e.g.
  there may be three parts to a question - (i), (ii), (iii), and a total of 12 marks allocated to the question. The marking scheme might be as follows: **6 + 3 + 3**. This means that the first correct answer encountered is awarded 6 marks and each subsequent correct answer is awarded 3 marks.

- Square brackets and/ or *italics* are used where the examiner's attention is being drawn to an instruction relating to the answer or to some qualification of the answer.

- Examiners should write the total mark for each question at the beginning of the question, beside the question number, and circled.

- The cumulative total should be written in the bottom right-hand corner of each page on which a question total appears.

- All blank pages should be marked to indicate they have been inspected.

Q 1 Any six parts to be answered 6(10)

(a)	(i) *Livestock unit:* Amount of feed eaten by a (550 kg) mature cow (or correct number of other farm animals) **or** equivalent to 12 tonnes of dry matter per annum (ii) *For mature dairy cow:* 1 LU *For mature sheep:* 0.14-0.2 LU	**4+3+3**
(b)	*Diagram of wind pollinated flower* *Drawing to show:* feathery stigma and stamens outside flower and no petals (or reduced petals) *Labels:* carpel/ stigma/ style/ ovary/ stamen/ anther/ filament/ bracts (or small petals) ***Any four***	**6, 3, 0** **4(1)**
(c)	(i) 1. *Thyroid location:* Near larynx (or trachea) **or** in neck 2. *Adrenal location:* On top of kidney (ii) 1. *Thyroid hormone:* Thyroxine **or** calcitonin 2. *Adrenal hormone:* Adrenaline **or** cortisone **or** cortisol	**2(3)** **+** **2(2)**
(d)	(i) *FCR:* Number of kg of feed required to produce 1 kg LWG **or** ratio of food consumed to liveweight gained (ii) *Factors affecting FCR in pigs:* Diet/ breed/ health/ housing **or** temperature/ management/ age/ sex ***Any two***	**4+3+3**
(e)	*Function of plant cell types* (i) *Xylem:* Transport of water (or minerals) **or** strength **or** support (ii) *Phloem:* Transport of (named) food **or** translocation (iii) *Epidermis:* Protection against water loss **or** against infection **or** prevents damage **or** regulates gas exchange **or** boundary **or** secretes metabolic compounds **or** root hairs in the epidermis absorb water and minerals	**4+3+3**
(f)	*Functions in avian digestive system* (i) *Gizzard:* Uses grit/ for physical (or mechanical) digestion **or** muscular (ii) *Crop:* Storage of food/ temporarily **or** for later release for digestion ***Any three***	**4+3+3**
(g)	*Gestation period in days* *Pig:* 113 – 117 days *Sheep:* 145 – 150 days *Cow:* 280 – 288 days	**4+ 3+3**
(h)	*Diagram of cow's reproductive system:* *Drawing to show:* Vagina and uterus and oviduct and ovary *Labels:* Vagina/ uterus/ oviduct/ ovary/ cervix ***Any three***	**4, 2, 0** **3(2)**
(i)	*Qualities of wool as a material:* Hard-wearing/ lightweight/ dirt resistant/ ignition resistant/ absorbs moisture/ mordant (or holds dye well)/ (temperature) insulation/ flexible ***Any three***	**4+3+3**
(j)	*Why hedgerow conservation encouraged:* Shelter **or** protect buildings/ habitat **or** wildlife corridor/ biodiversity/ biosecurity/ land division/ increase soil (or air) temperature/ aesthetic ***Any three***	**4+3+3**

Q 2

<table>
<tr>
<td>(a)</td>
<td>(i) Soil type: Name of soil type
Diagram of named soil profile
Drawing to show:
At least three horizons which must match the named soil type
Labels: Any three valid labels for named soil type
(ii) Factors responsible for creating soil horizons:
Correct factors for two horizons (particular rather than general)
O horizon: waterlogging or anaerobic conditions or low pH or build-up of organic material
A horizon: activity of soil animals (or plant roots) or presence of humus (or organic matter)
B horizon: leaching of nutrients or build-up of nutrients from the A (horizon) or less organic matter (or humus)
C horizon: weathering of parent rock</td>
<td>3

4, 2, 0
3(1)

2(3)</td>
</tr>
<tr>
<td>(b)</td>
<td>(i) Soil texture: Relative proportions of different particles in a soil or sand, silt and clay by %
(ii) Comparing soil texture types:
<table>
<tr><td></td><td>Clay</td><td>Sandy</td><td>Loam</td></tr>
<tr><td>Fertility</td><td>High</td><td>Low</td><td>High</td></tr>
<tr><td>Temperature</td><td>Low</td><td>High</td><td>High</td></tr>
<tr><td>Drainage</td><td>Poor</td><td>Good</td><td>Good</td></tr>
<tr><td>Ease of tilling</td><td>Poor</td><td>Good</td><td>Good</td></tr>
</table></td>
<td>4

4(2+2)</td>
</tr>
<tr>
<td>(c)</td>
<td>Experiment to show earthworm activity in soil:
Wormery/ layers (or sand, chalk, clay)/ organic matter on top/ add worms/ cover/ leave in a cool place/ keep moist/ minimum of a week/ control/ correct result Any six</td>
<td>6(2)</td>
</tr>
</table>

Q 3 **Option one**

(a)	(i) *BCS:* Assessment of level of fat reserves in an animal's body **or** lean-to-fat ratio (ii) *Optimum BCS of a dairy cow* *At calving:* BCS 3.0 – 3.5 *At mating:* BCS 2.5 – 3.0 (iii) *Consequences of not being at optimum BCS* *At calving:* BCS low: small calf **or** reduced milk yield **or** metabolic diseases **or** BCS high: calving difficulty *At mating:* BCS low: irregular heat pattern **or** poor conception rate **or** metabolic diseases	**4** **3** **3** **3** **3**
(b)	(i) *Bacterial diseases of dairy cows:* TB/ brucellosis/ mastitis/ leptospirosis/ blackleg/ Johne's disease/ anthrax/ bacterial pneumonia/ foot rot/ (bovine) conjunctivitis (or pink eye) ***Any two*** (ii) *Deficiency disorders of dairy cows:* e.g. Milk fever/ grass tetany ***Any two*** (iii) *Preventative measures:* *TB or Brucellosis:* Closed herd **or** biosecurity **or** fencing **or** culling **or** testing *Mastitis:* Hygiene **or** fly control **or** dry cow treatment **or** culling *Blackleg or bacterial pneumonia or leptospirosis:* Vaccination **or** hygiene *Foot rot:* Foot bath **or** paring *Johne's disease:* Culling **or** do not mix colostrum *Anthrax*: Culling *Pink eye:* Vaccination **or** fly control *Milk fever:* (Dairy) ration **or** minerals **or** licks **or** bolus **or** adding minerals to water **or** pasture dressing **or** correct BCS at calving *Grass tetany:* Bolus **or** licks **or** (dairy) ration **or** adding Mg soln. to water **or** avoid fresh grass and clover **Four measures to match the diseases and disorders given in (i) and (ii)**	**2(2)** **2(2)** **4(2)**
(c)	(i) *Changes in beef calf diet, from birth to weaning:* *Colostrum [*compulsory*]/ milk/ milk replacer/ concentrates/ hay/ grass ***Colostrum plus any other three, all in correct order*** (ii) *How changes affect ruminant stomach development:* Hay **or** concentrate/ develops rumen flora **or** scratch factor	 **4(3)** **2(2)**

OR

Q 3 **Option two**

<table>
<tr><td>(a)</td><td>Life cycle of fungus that affects potato
Name of fungus: Phytophthora infestans or potato blight (fungus)
Drawing of life cycle to feature: A leaf TS with a sporangiophore emerging from a stoma, and at least one labelled hypha or haustorium or sporangium or zoospore
Description: Haustoria absorb food (from cells)/ sporangiophores grow out of stomata/ sporangia break off/ (sporangia become) airborne/ onto soil/ (sporangia) germinate in humid conditions (or develop into conidium if dry)/ produce zoospores/ infect tubers or growing plants Any five</td><td>2

4, 0

5(2)</td></tr>
<tr><td>(b)</td><td>Cultivation of a named cereal

<table>
<tr><td></td><td>Barley</td><td>Wheat</td><td>Oats</td><td>Maize</td></tr>
<tr><td>(i) Soil requirements</td><td>pH 6 – 6.5/ fertile/ sandy loam or free draining/ brown earth or grey-brown podzolic</td><td>pH 5 – 7/ soil as for barley</td><td>pH 5.5 soil as for barley</td><td>pH 6.6 – 7/ soil as for barley</td></tr>
<tr><td>(ii) Climate</td><td>Warm/ moist/ dry or sunshine</td><td>As for barley</td><td>As for barley</td><td>As for barley</td></tr>
<tr><td>(iii) Harvest date</td><td>July - September</td><td>July - Sept.</td><td>July - Sept.</td><td>July - Sept.</td></tr>
<tr><td>(iv) Yield</td><td>6 – 8 t/ ha for spring or 8 – 9 t/ ha for winter</td><td>7 – 8 t/ ha for spring or 9 – 11 t/ ha for winter</td><td>6 – 7 t/ ha for spring or 7 – 8 t/ ha for winter</td><td>15 – 20 t/ ha of dry matter</td></tr>
</table></td><td>Name 2

2(2)

2(2)

3

3</td></tr>
<tr><td>(c)</td><td>(i) Indirect control of weeds:
Any method of control that is effective despite not being targeted at the affected species (accept a method that does not use chemicals)
(ii) Examples of indirect control:
Crop rotation/ growth encouragement/ stubble cleaning/ aggressive crop varieties/ early harvest/ ploughing/ use certified seeds/ catch crop/ earthing up Any four</td><td>4

4(3)</td></tr>
</table>

Q 4 Laboratory or field methods Any two parts to be answered 2(24)

(a)	*Percentage sugar in grass:* Dry grass sample/ chop/ freezer bag/ roll **or** remove air/ freeze/ squeeze **or** collect sap/ refractometer/ read % from scale/ repeat (to establish statistical significance) ***Any six***	**6(4)**
(b)	*Effect of shading on crop growth:* 1 m^2 (plots or other measured areas) **or** transect(s)/ one shaded **and** one unshaded/ sow crop seeds **or** established crop/ similar (or named) conditions/ leave for a time appropriate for crop/ harvest **or** measure/ compare yields (or growth differences)/ correct result/ repeat (to establish statistical significance) ***Any six***	**6(4)**
(c)	*Enzyme action:* *Amylase [*compulsory*]/ two test tubes/ add equal amounts of starch solution (to each)/ add amylase to one/ other is control/ waterbath at 37 °C/ at least 5 min./ add iodine/ negative for starch/ Benedict's or Fehling's/ positive (or brick red) for reducing sugar/ repeat (to establish statistical significance) **OR** *Catalase [*compulsory*] / fresh liver sample (or celery or potato or other suitable source)/ one cubed, one chopped, one boiled/ add a few drops of washing-up liquid to each/ use buffer solution/ add equal amounts of hydrogen peroxide/ compare number of bubbles produced (or height of foam)/ catalase breaks down hydrogen peroxide/ high temperature denatures catalase/ repeat (to establish statistical significance) ***Enzyme name plus any other five***	**6(4)**
(d)	*Botanical composition comparison:* Quadrat/ random/ record plants/ repeat (x 10)/ repeat for other pasture/ identification key/ frequency/ compare/ sample results ***Any six***	**6(4)**

Q 5

(a)	*Hill v. lowland sheep production:* *Mountain/ Hill* — *Lowland* Extensive (or low) stocking rate — Intensive (or high) stocking rate Low production — Higher production Rough grazing — Better grazing High mortality — Lower mortality Single lambs — More than one lamb Breed example — Breed example Low labour — High labour ***Any four***	**4(2+2)**
(b)	*Management practices at lambing:* Housing/ feeding concentrates/ supervision (or assistance)/ lambing pens/ colostrum/ fostering/ infra-red lamp/ iodine on navel cord **or** other point of disease control (or hygiene) ***Any four***	**4(4)**
(c)	*Sheep Welfare Scheme features* (i) *Methods* *Lameness control:* Regular checking **or** footbath **or** antibiotic spray **or** paring hooves **or** vaccination *Flystrike control:* Dipping **or** pour-on **or** shearing **or** dagging **or** tail docking *Scanning in-lamb ewes:* Ultrasound scanner **or** scanner placed on abdomen (ii) *Benefits* *Lameness control:* Increased production levels **or** more constant grazing *Flystrike control:* Increased production **or** more constant grazing **or** lower mortality rates *Scanning in-lamb ewes:* Identify multiple births **or** allow for correct feeding levels **or** helps to prevent twin-lamb disease **or** identify barren ewes	**4(3)** **+** **2(2)**

Q 6

(a)	(i) *Reseeding grassland:* Direct sowing: total herbicide applied/ ploughed/ fine seed bed/ seeds sown by drill **or** broadcast/ chain harrow/ fertilise Stitching in: old grassland not killed (or not checked back)/ slit made in land/ grass seeds sown by drill/ fertilise Undersowing: land is ploughed (or tilled)/ grass seeds sown with tillage crop (or nurse crop)/ nurse crop harvested/ grassland establishes Direct drilling: grass killed off/ fertiliser and slug pellets drilled in with grass seed/ used in soil subject to poaching (or shallow or stony soils) Slurry seeding: seeds drilled into ground/ slurry is applied during or after sowing/ successful with adequate rainfall (ii) *Establishment of newly-sown grass:* Progression from emerged seedlings to thick grass sward (iii) *Practices for successful establishment:* Tillering/ grazing with light stock **or** topping **or** rolling/ manure (or fertiliser) application/ weed control/ use certified seed/ use productive (or named) grass species ***Any two***	**Any two method names 2(2) + Matching descriptions 2(2+2)** **4** **2(2)**
(b)	(i) *Productivity features of PRG v. IRG:* *PRG* *IRG* Tillers vigorously Tillers less vigorously Aggressive Less aggressive Persistent Less persistent Fast-growing Faster than PRG Long growing season Longer growing season ***Any three*** (ii) *Hybrid grasses and why they are used* *What are they:* Result of crossing of different species e.g. PRG and IRG *Why use them:* Hybrid vigour **or** best qualities of crossed species combined	**3(2+2)** **2** **2**
(c)	(i) *How better grassland management prevents more cattle parasite infestation:* Rotational grazing (or mixed grazing or leader-follower grazing) disturbs parasite life cycle/ reseeding disturbs parasite lifecycle/ scrub removal (or topping) removes parasite habitat/ draining (or fencing off) wet land disturbs the life cycle of the liver fluke/ liming disturbs life cycle of liver fluke ***Any two*** (ii) *Examples of cattle parasites:* Stomach worms/ lung worms/ ticks/ liver fluke ***Any two***	**2(3)** **2(3)**

Q 7

<table>
<tr>
<td>(a)</td>
<td>(i) Polyploidy
Explain: (Cells with) more than two sets of chromosomes (or 3n or higher)
Example: Wheat or strawberry plants or grasses (or named grasses) or beet or endosperm (tissue) or 3n (or higher)
(ii) Freemartin condition
Explain: Infertility in some female animals with a male twin
Example: Calves
(iii) Micropropagation
Explain: Plant tissue grown to produce clone(s) (or to produce plants identical to the parent)
Example: Seed potato propagation</td>
<td>3 + 2

3 + 2

3 + 2</td>
</tr>
<tr>
<td>(b)</td>
<td>Dihybrid cross:
Parental genotype: GgNn

<table>
<tr><td>(Gametes↓→)</td><td>GN</td><td>Gn</td><td>gN</td><td>gn</td></tr>
<tr><td>GN</td><td>GGNN</td><td>GGNn</td><td>GgNN</td><td>GgNn</td></tr>
<tr><td>Gn</td><td>GGNn</td><td>GGnn</td><td>GgNn</td><td>Ggnn</td></tr>
<tr><td>gN</td><td>GgNN</td><td>GgNn</td><td>ggNN</td><td>ggNn</td></tr>
<tr><td>gn</td><td>GgNn</td><td>Ggnn</td><td>ggNn</td><td>ggnn</td></tr>
</table>

Gamete genotypes, across:
Gamete genotypes, down:
Offspring genotypes grid:

Grey colour, normal antennae 9
Grey colour, twisted antennae 3
Ebony colour, normal antennae 3
Ebony colour, twisted antennae 1

[Allow correct fractions or decimals or percentages in place of 9, 3, 3, 1]

Offspring phenotypes
Matching ratio [2 = correct ratio not matched to phenotypes]</td>
<td>2

2, 0
2, 0
4, 0

4(1)
4, 2, 0</td>
</tr>
<tr>
<td>(c)</td>
<td>(i) Embryo transfer:
Embryos from one (or donor) animal/ implanted into surrogate (or other animal)
(ii) Benefits of embryo transfer:
More offspring from superior (stock)/ genetic improvement/ produces replacement stock/ reduces pregnancy stress on superior animal/ allows import and export of embryos/ (allows) beef (production) in dairy enterprise/ decreases time for genetic improvement Any three</td>
<td>2(3)

3(3)</td>
</tr>
</table>

Q 8 Any two parts to be answered 2(24)

(a)	(i) *Grass to silage – what's happening:* Anaerobic conditions/ *Lactobacillus* species/ fermentation/ carbohydrates in grass/ converted to (weak) acids/ lowers pH/ kills bacteria/ grass preserved ***Any four*** (ii) *Practical steps related to what's happening:* Cut grass when dry to have increased carbohydrate in grass/ cut at correct heading-out stage to encourage lactic acid (or weak acid) production/ cut in the afternoon to take advantage of maximum photosynthesis (or to increase carbohydrate)/ double (or precision) chopping (of grass) to increase surface area (or for *greater* bacterial access (or activity) or to release *more* sugars)/ roll well to expel air (or to provide anaerobic conditions)/ seal tightly to exclude air (or to provide anaerobic conditions)/ additives to increase carbohydrate/ wilting to increase carbohydrate concentration ***Any three***	**4(3)** **3(4)**
(b)	*NPK in plants* (i) *N: Function:* Chlorophyll **or** protein **or** leafy growth *Deficiency symptom:* Slow growth **or** low yield **or** pale green colour **or** yellowing of leaves *P: Function:* Root growth **or** reproduction **or** flower **or** seed formation *Deficiency symptom:* Stunted growth **or** low yield **or** blue colour on leaves **or** lack of flowers *K: Function:* Protein **or** translocation **or** disease resistance **or** seed (or fruit) formation *Deficiency symptom:* Reduced yield **or** poor growth **or** scorching of leaves **or** lodging **or** poor root development (ii) *Experiment to show effect of a deficiency:* Sterilise test tubes or containers/ seedlings in two tubes/ tablet minus nutrient/ tablet complete/ aeration/ similar conditions/ cover to prevent algae/ leave for a minimum of two weeks/ measure or compare/ correct result ***Any six***	**2** **2** **2** **2** **2** **2** **6(2)**
(c)	Any three parts of (i), (ii), (iii), (iv) to be answered (i) *Zero grazing:* animals are indoors or enclosed/ grass is cut to be brought in for feed *Strip grazing:* Allowing animals access a fresh strip of grass or forage crop daily/ moveable fence (ii) *Contact fungicides:* Kill fungi they touch/ fast acting/ more coverage needed ***Any two*** *Systemic fungicides:* Absorbed into plant/ translocated to all parts/ slow acting/ less coverage needed ***Any two*** (iii) *First early potatoes:* Harvested immature in June/ sown in early spring/ low yield/ sprouted/ grown in coastal regions (or under plastic) ***Any two*** *Maincrop potatoes:* Sown in late spring/ harvested fully mature in autumn/ high yield ***Any two*** (iv) *Abiotic factors:* Non- living factors/ in a habitat *Edaphic factors:* Soil factors/ in a habitat	**2(2)** **2(2)** **2(2)** **2(2)** **2(2)** **2(2)** **2(2)**

Q 9 Scientific explanations Any four parts to be answered 4(12)

(a)	*Trailing shoe to spread slurry:* Slurry in narrow bands on surface/ reduces N loss to atmosphere/ less smell/ environmentally friendly (or complies with farm schemes)/ reduces volatilisation/ early return to grazing ***Any three***	**3(4)**
(b)	*Thinning forestry trees:* Poorest (or diseased or damaged) trees removed/ reduces competition/ remaining trees grow faster/ improves tree quality/ improves size of trees/ income from thinnings ***Any three***	**3(4)**
(c)	*Algal bloom:* Eutrophication (or nutrient enrichment)/ run-off (or leaching)/ slurry (or silage effluent or fertiliser)/ rivers low/ warm water ***Any three***	**3(4)**
(d)	*Farrowing crate:* Restricts sow movement/ prevents crushing of bonhams/ ease of suckling/ bonhams can access creep area or higher temperature/ better survival rates ***Any three***	**3(4)**
(e)	*Rushes in gley soils:* Impeded drainage/ high water table/ rushes grow well in poorly-drained land/ temporary inaccessibility of land for spraying (or for topping)/ cold soil means less competition from other plants ***Any three***	**3(4)**

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