Leaving Certificate Higher Level Crop Questions

2010

1. (j) Briefly describe a symptom of attack on a crop plant by **each** of the following invertebrates:
   (i) Aphids
   (ii) Flea beetles
   (iii) Leatherjackets

Option Two

3. (c) Give **three** reasons for a low rate of seedling establishment in a spring-sown crop.

6. (a) List **four** components of a blight control programme for maincrop potatoes.

   (b) Give **four** reasons why scutch grass (*Agropyron repens*) is considered by tillage farmers to be a troublesome weed.

   (c) Explain the following term:
   (i) *plough pan*

   (d) Describe how you would calculate the 1000 grain weight of a cereal.

2010Marking_Scheme

2009

5. (a) Describe the cultivation of spring barley **or** main-crop potatoes under the following headings:
   (i) Soil requirements
   (ii) Rotation
   (iii) Weed control
   (iv) Yield (tonnes per hectare).

   (b) (i) Explain the following terms as they apply to artificial fertilisers:
   Placement
   Broadcasting
   Top-dressing
   (ii) Suggest a crop situation in which **one** of the above methods is used.

   (c) Consumer demand in Ireland is for floury (high dry-matter) potatoes.
   (i) Suggest a suitable compound fertiliser for the production of floury tubers.
   (ii) Give **three** causes of low dry matter in potato tubers.

2009Marking_Scheme

2008

1. (c) Explain why the growing of seed potatoes is situated predominantly in county Donegal.

Option One

3. (a) (i) List **three** advantages of crop rotation.
(ii) Name **two** crops that can be grown as a suitable root break in a cereal rotation.
(iii) State any **one** use for one of the crops you have mentioned.

(b) List **four** factors that are considered by the Department of Agriculture, Fisheries and Food when recommending varieties of cereals to be grown by farmers.

(c) Identify the type of organism which causes each of the following diseases and explain how each disease could be controlled or prevented:
(i) club root in turnips,
(ii) leaf roll in potatoes,
(iii) loose smut in barley,
(iv) common scab in potatoes.

2008Marking_Scheme

2007

1. (b) Mention **three** features that distinguish the production of malting barley from feeding barley.

Option Two

3. (a) In relation to a **named** root crop, describe the approaches a farmer might take to control weeds effectively.

(b) (i) Describe the physiological changes occurring in a barley plant during the ripening process.
(ii) Mention **two** tests a merchant might carry out when purchasing grain from a farmer.

(c) Describe the production of a **named** catch crop on a tillage farm.

2007Marking_Scheme

2006

Option Two

3. (a) (i) Name **two** viral diseases of potatoes.
(ii) In the case of **one** disease state how it is spread.
(iii) Mention **one** method used to prevent the spread of this disease.

(b) Describe the life cycle of a **named** parasitic fungus, which causes a disease in a crop, under the following headings:
(i) Mode of reproduction.
(ii) Mode of nutrition.
(iii) Environmental conditions that favour the spread of the disease.

8. (c) (i) Explain why a good seed bed is essential for successful crop production.

(ii) Outline the importance of soil moisture in the development of a seedling of a crop.

(iii) Explain why farm implements called rollers are used during the cultivations of a **named** cereal crop as follows:

1. Preparation of soil for sowing.
2. After sowing the seed

2006Marking_Scheme

2005

1. (d) (i) Name the plant in photograph A.

(ii) Name the family to which it belongs.

(iii) State the expected yield per hectare of this crop.

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A

(g) Speckled yellows is a disease of sugar beet caused by a deficiency of a trace element.

(i) Name the trace element involved.

(ii) Name another disease of sugar beet caused by a deficiency of a **named** trace element.

Option One

3. (a) (i) Outline how **two** factors have influenced the geographic locations of tillage farming in Ireland.

(ii) Name **one** crop that could be grown using the method shown in photograph B.

(iii) State **two** advantages of using this method

ALEX BARTEL/ SCIENCE PHOTO LIBRARY

B

(b) Describe two non-chemical methods by which **each** of the following may be controlled in crop production:

(i) Weeds

(ii) Pests

(c) Suggest **four** reasons for using certified seed in the sowing of a cereal crop.

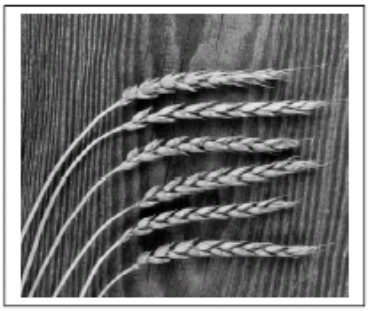
2005Marking_Scheme

2004

1. (c) Describe how a **named** plant pest could be controlled biologically.

(f) (i) Identify the **two** crops in photographs C and D.

(ii) Distinguish between the two crops at the inflorescence stage of growth.



Astrid & Hanns-Frieder Wichler/Science Photo Library

C

TH Foto-Werbling/Science Photo Library

D

(j) Give **two** reasons why it is necessary to have strict controls in the application of pesticides to farm crops.

8. (b) Describe the main cultivation practices in the production of a **named** root crop. State the expected yield per hectare of your chosen crop.

(c) (i) Explain how a **named** fungus may affect the growth of a farm crop.

(ii) Explain how plant diseases can be prevented and controlled on a tillage farm.

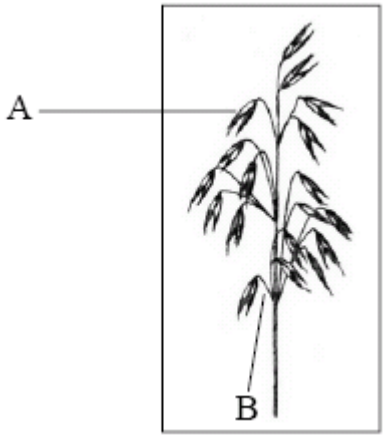
2004Marking_Scheme

2003

1. (d) The diagram is that of common oat (*Avena sativa*).

(1) To which plant family does oats belong?

(2) Name the parts labelled A and B.



Option One

3. (c) Write brief notes on … the following:

(ii) Catch crops on modern farms

6. (a) Outline the main stages involved in producing a named cereal crop under the following headings:
   (1) Soil type
   (2) Seed bed preparation
   (3) Sowing of the seed
   (4) Use of fertilizer
   (5) Harvesting the crop

   (b) Give a detailed explanation of the importance of:
   (1) Crop rotation on a farm specialising in the production of tillage crops
   (2) Using certified seed

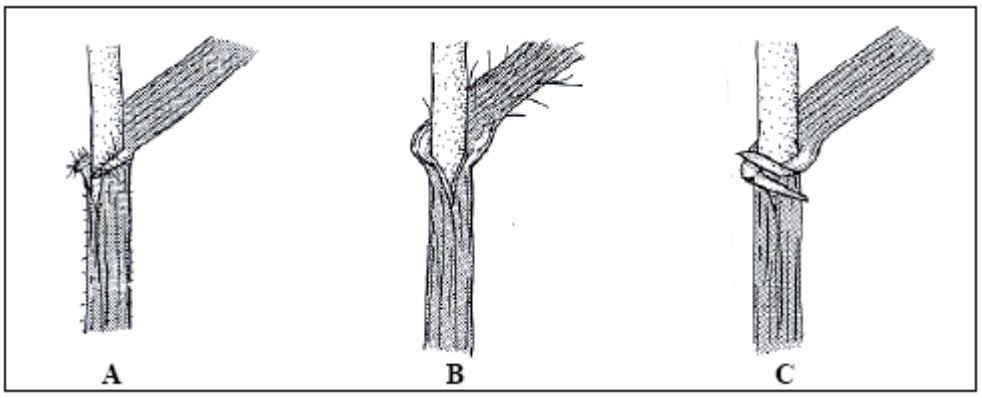
2003Marking_Scheme

2002

1. (j) Name **one** crop plant from each of the following families:
   (1) Cruciferae
   (2) Leguminosae
   (3) Solanaceae

Option Two

3. (a) The diagram shows the leaves and auricles of three cereals at the grass corn stage. Identify which of the diagrams represent wheat, oats and barley.



   (b) Name and describe **two** methods of cereal grain storage which will prevent damage to the cereal for a period of six months after harvesting.

   (c) Explain how you would estimate each of the following for a quantity of barley seed.
   (1) Percentage purity
   (2) Percentage germination

2002Marking_Scheme

2001

Option Two

3. (a) Write brief notes on … the following:
   (i) crop rotations

6. (c) Describe the cultivation of any named tillage crop under each of the following headings:
   (i) soil suitability
   (ii) seed-bed preparation
   (iii) fertiliser requirements
   (iv) yield per hectare.

2001Marking_Scheme

2000

1. (i) Explain briefly how crop rotation helps the practice of weed control in tillage.

5. (b) Describe the soil and nutritional requirements for the production of a named root or cereal crop.

6. (c) Give three reasons which may contribute to a high incidence of lodging in a named cereal crop.

1999

1. (g) Use a labelled diagram to show the location of the awn in a barley seed.

   (h) List three characteristics of certified seed.

   (i) List two reasons why it is advisable to practice crop rotation on a tillage farm

8. (c) Explain how you would determine the yield in tonnes per hectare of ware potatoes **or** of sugar beet at the time of harvesting.

1998

1. (c) Briefly explain why black spots may appear on the leaves of potato plants during the growing season

   (f) State the expected yield per hectare in the case of each of the following farm crops:
   Barley, Oats, Potatoes and Sugar Beet.

5. (a) Describe the production of a named cereal crop under each of the following headings:
   (i) Fertility
   (ii) Variety
   (iii) Pre and Post harvesting stage.

   (b) Outline the principal practices involved in sugar beet or potato production following a lea.

   (c) Describe a laboratory test you carried out to estimate the content of sugar in sugar beet.

1997

Option One

3. (a) Write notes on each of the following:
   (i) Crop rotation
   (ii) Combine drilling
   (iii) Nutrient uptake by plants

   (b) Give reasons for a low rate of seedling establishment following sowing in early Spring.

8. (b) Describe the key factors which influence the growth and spread of a named fungus affecting a named farm crop. Draw a labelled diagram of the fungus you named.

   (c) Describe the cultivation of a named farm tillage crop under each of the following headings:
   (i) Place in rotation
   (ii) Recommended varieties;
   (iii) Method of cultivation
   (iv) Yield in tonnes per ha.

1996

1. (b) Give three reasons for the practice of crop rotation.

   (h) Mention the factors you would consider in deciding on the seeding rate for winter barley.

   (i) Explain, giving a named example, what is meant by biological control of a crop pest.

8. (c) Describe the cultivation of a named farm crop, excluding grass under each of the following headings:-
   (i) Sowing rate;
   (ii) Disease prevention and control
   (iii) Fertiliser treatment.

2010 Marking Scheme

1. (j) (i) leaves have holes/ light coloured patches/ sticky sap oozing/ new growth deformed/ viral diseases or named viral disease
(ii) holes on leaves of young plant
(iii) bare patches in ground/ seedlings eaten/ young stems bitten-fallen over at soil surface/ roots damaged/ stems damaged 6m+2m+2m

Option Two

3. (c) not certified seed/ pests or named/ drought/ too cold/ too wet/ weeds/ unsuitable soil type/ compacted soil/ disease (damping off) 3 (4m)

6. (a) BLIGHT:
sow certified seed/ no overwintering (dumps)/ eliminate volunteers/ resistant varieties/ begin spray program early/ use most suitable fungicides/ listen for weather alerts/ spray/ not less than every 10 days/ earthing up/ burn off stalks 2 weeks before harvest// ROTATION is not a point 4 (3m)

(b) SCUTCH:
creeps underground/ persistent/ has underground rhizomes/ cultivation spreads the weed by veg propagation/ spreads from headland when crop is lifted/ difficult to control/ even spraying only makes it retreat into headland/ requires glyphosphate (roundup) or TCA to control it (selective herbicide)/ rotation has no effect on it/ competes with the crop/ one example of competition/ same family as cereals 4 (3m)

(c) (i) PLOUGH PAN:
hard layer/ under soil at plough level (20-25cm approx, same depth repeatedly)/ caused by over cultivating/ no root break/ prevents drainage/ causes flooding/ prevents roots penetrating downwards/ broken by sub-soiler or deep ploughing 2 (3m)
(ii) N-FIXATION:
<u>nitrogen converted to nitrates</u>/ incorporated into bacteria/ named bacteria/ symbiotic or mutualistic/ named plant sp./ or into soil directly/ by action of lightening <u>First point compulsory</u> 2 (3m)

(d) EXPERIMENT:
1000 grain weight: named cereal (wheat, oats, barley..)/ balance/ container (crucible)/ remove damaged seeds, screenings etc/ count out 1000 good seeds or stated number/ weigh/ record/ repeat/ and get an average value/ correct calculation for 1000 grain weight 4 (3m)

2009 Marking Scheme

5. (a) (i) Soil requirements: Barley: (sandy) loam or suitable soil type/ good drainage/ pH 6.0-6.5/ fertile
Potato: loam or suitable soil type/ deep soil/ grow well on wide range/ stone free/ pH 5.0-5.5/ fertile 4m

(ii) Rotation: Barley: very tolerant of continuous sowing
Potato: 1 year in 4/ last crop before lime 4m

(iii) Weed Control: Barley: crop rotation/ stubble cleaning/ certified seed/ herbicides
Potato: stale-seedbed/ deep ploughing/ shading effect of leaves/ ridging (earthing up)/ pre-emergence and post-emergence herbicides/ remove by hand/ scuffling/ hoeing 4m

(iv) Yield (tonnes/ha) Barley: 5-7
Potato: 30-40 4m

(b) (i) Placement: fertiliser is placed in hand near line of seeds
Broadcasting: fertiliser is scattered onto ground and incorporated into soil
Top-Dressing: fertiliser scattered onto a growing crop 3(4m)

(ii) Example of placement: Potatoes/ cereal/ grassland
Example of broadcasting: Beet/ grassland/ cereal
Example of top-dressing: cereal/ grass 4m

(c) (i) 7-6-17 or 10-10-20 4m

(ii) Too much nitrogen/ delays maturity/ K_2SO_4 or sulphate of potash/ (in the compound) gives a drier tuber than KCl (muriate of potash) (too much chlorine)/ lack of potassium/ variety/ lack of sunshine/ category 3 (4m)

2008 Marking Scheme

1. (c) climate (cool/ windy)/ not suitable for aphids/ aphids transmit virus (disease) 6m+4m

Option One

3. (a) (i) control of pests/ disease/ helps maintain soil structure/ helps maintain organic matter/ weed control/ better farm management/ nutrient balance 3 (3m)

(ii) suede or turnip/ fodder beet/ potatoes/ etc. (any root crop) 2 (3m)

(iii) matching use – fodder for cattle/ food for humans etc. 3m

(b) yield/ length of straw/ strength of straw (lodging)/ earliness of ripening/ disease resistance/ suitability to locality/ mating quality 2(3m)+2(2m)

(c) (i) fungus/ rotation/ lime soil/ use resistant variety/ drainage/ fungicide 3m+2m

(ii) virus/ control of aphids/ certified seed potatoes 3m+2m

(iii) fungus/ seed treatment (certified seed)/ fungicide 3m+2m

(iv) bacterium/ grow crop in low pH soil/ early irrigation/ resistant varieties/ crop rotation 3m+2m

2007 Marking Scheme

1. (b) different varieties/ different cost of production/ different soil requirements/ different grain quality (e.g. protein content)/ malting barley sown on contract/ higher price for malting barley/ lower N requirement for malting barley/ malting barley requires more care when growing or harvesting/ malting barley more sensitive to drought/ malting barley sown in certain areas in Ireland 5m+3m+2m

Option Two

3. (a) name [allow potato] 3m

rotation removes weed/ deep ploughing buries weeds/ earthing up prevents weed growth/ spraying potatoes post-emergence stops weed growth/ autumn ploughing/ inner-row cultivation (scuffling)/ stubble cleaning/ hand weeding 4 (3m)

(b) (i) grains swell or get heavier/ moisture % decreases (grain hardness)/ food moves from green parts to grain ends/ starch stabilises [allow bleaching of straw/ head turning downwards/ grains fall off] 3 (3m)

(ii) test for moisture %/ screenings (test for purity)/ test for protein/ test for starch (Hagberg)/ colour test/ mycotoxin test/ weight per seed (thousand grain weight or hectolitre weight)/ germination test 2 (3m)

(c) name (e.g. rape, kale, stubble turnip, cabbage, grass, legume, lettuce) 3m

grown between two main crops/ any three cultivation procedures/ when sowed/ when harvested/ what used for/ when used/ how it is used/ what animal feeds on it/ [do not accept ploughing] 5 (3m)

2006 Marking Scheme

Option Two

3. (a) (i) leaf roll/ mosaic/ etc. (virus X/ virus Y) — any two — 2 (3m)
(ii) aphids/ contact — 3m
(iii) control aphids/ certified seed/ location — 3m

(b) named fungus or disease (e.g. potato blight/ blackleg/ violet root rot/ downy mildew)
(i) spores — 3m
(ii) hyphae (or haustoria)/ penetrate wall/ digest organic matter in host/ absorb digested material through hypha — any two — 3m+3m
(iii) damp weather — 3m

8. (c) (i) support for plant/ aeration of soil for respiration/ water for plant/ good seed-soil contact/ nutrients for growth/ germination — any two — 4m+2m
(ii) intake of water into roots (osmosis)/ water needed for transport/ for support or turgidity/ nutrients in solution/ photosynthesis — any two — 4m+2m
(iii) Name — 3m
1. breaking large clods/ smoothing and firming soil/ burying stones — any two — 4m+2m
2. compacting soil around seed/ improves water intake/ improves capillarity — 3m

2005 Marking Scheme

1. (d) (i) potato
(ii) Solanaceae
(iii) 30-40 tonnes (12-16 tonnes per acre)
5-10 tonnes (2-4 tonnes per acre) – must specify early crop — 3m+3m+4m

(g) (i) manganese
(ii) boron/ heart rot or crown rot — 3m+3m+4m

Option One

3. (a) (i) sunshine/ rainfall/ topography (aspect)/ soil type/ proximity to market — any two — 3m+3m
(ii) strawberries/ maize/ etc — any one — 3m
(iii) protects against frost/ retains heat (warmer root temperature)/ biodegradable/ earlier crop/ weed control/ higher yield/ encourages germination — any two — 6m+3m

(b) (i) crop rotations/ inter-row cultivation/ mulches/ flame weeding/ autumn ploughing/ shading/ stubble cleaning/ rogueing/ growth encouragement/ earthing up — any two — 6m+3m

(ii) crop rotations/ resistant varieties/ harvesting without delay/ scarecrows/ guns/ bangers/ biological control/ stubble cleaning/ liming/ netting/ fleece/ autumn ploughing — any two — 6m+3m

(c) increased percentage germination/ better establishment rate/ true to type/ minimum weed infestation/ marketing/ disease control/ hybrid vigour/ better yield/ pest control — any four — 4 (3m)

2004 Marking Scheme

1. (c) name of pest (animal) — 5m
biological control (natural or managed) — 5m

(f) C = wheat D = barley — 3m+3m
beard (awns) on barley/ thinner grains on barley/ head parallel to stem on barley/ long auricles on barley/ hairless auricles on barley — any one — 4m

(j) to avoid pollution/ to prevent accumulation in food chain/ damage to wildlife/ residue in crops/ risk to handlers/ to comply with REPS/ affects pollution — any two — 5m+5m

8. (b) named crop — 2m
practices: plough/ stone free/ pH5.5/ fertilising/ soil test/ rotovate/ sow refer to method or spacing)/ ridge/ spray/ pest control/ disease control/ harvest/ storage etc. — any five — 5 (4m)
yield: — 2m

(c) (i) named fungus (e.g. blight, mildew, rust, *Rhyncosporium*) — 4m
effect on growth: spots or mycelium on leaves/ less photosynthesis/ feeds on sap/ lower yield/ rotten tubers/ lodging in cereals — any two — 2 (4m)

(ii) prevention and control: monitoring growth regularly/ certified seed/ resistant varieties/ crop rotation/ autumn ploughing/ spraying/ removing diseased plants/ harvesting without delay/ growth encouragement/ biological control — any three — 3 (4m)

2003 Marking Scheme

1. (d) 1. Gramineae — 4m

2. A = spikelet B = panicle/ petiole/ stalk — 3m+3m

Option One

3. (c) (ii) Catch crops

example/ crop grown between two main crops/ best utilisation of land/ catch crop a winter grazing food for animals/ less outlay on fodder/ break in tillage reduces incidence of pests and diseases/ weed control by shade control/ low labour input/ etc/ — any three — 3m+3m+2m

6. (a) Named cereal crop — 3m

(1) pH 6-6.5/ deep/ sandy loam/ grey brown podzolics/ brown earths/ etc. — any two — 2 (3m)

(2) plough/ harrow/ produce fine seed bed/ etc. — any two — 2 (3m)

(3) time of sowing/ method/ rate/ etc. depending on cereal type — any two — 2 (3m)

(4) 10:10:20/ N/ P/ K/ or relevant element (s) named/ amount of fertiliser related to soil type/ — any two — 2 (3m)

(5) combine harvester/ time/ yield/ etc. — any one — 3m

(b) (1) Control of soil-borne diseases/ pests/ maintenance of soil structure/ of organic matter/ of fertility/ weed control — any two — 6m+3m

(2) Disease free/ high germination rate/ high purity type/ free of weed seeds/ seed dressing — any two — 6m+3m

2002 Marking Scheme

1. (j) **Cruciferae** = e.g. cabbage or valid named example
Leguminosae = e.g. Clover or valid named example
Solanaceae = e.g. Potato or valid named example — 5m+3m+2m

Option Two

3. (a) A = Wheat
B = Oats
C = Barley — 1(6m)+2(5m)

(b) *Name of cereal grain storage*

1. Grain Drying/ Moisture content — 2m

2. Acid Treatment — 2m

Grain Drying / reduction of moisture content

Grain dried to 14%/ moisture to prevent germination or sprouting of the grain/ and bacterial, fungal, insect or pest attack. High moisture content at harvest the more expense incurred in drying it/ effect of making cereal very dusty/ cost 3 (2m)

Acid treatment

If required for rolling, a higher moisture content is required/ to prevent respiratory irritation of the animals being fed/ propionic or sulphuric acid is spread on to the grain/ rate of 3-5l per tonne/ kills the embryo/ prevents sprouting/ protects the grain against bacterial, fungal, insect and peat attack 3 (2m)

(c) *Percentage purity of Barley seed*

The number (or weight) of contaminants e.g. anything bar barley, weed seeds, other seeds and other matter, is recorded/ sieved out/ counted out/ % of these recorded/ % of pure seed calculated 4 (2m)

Percentage Germination of Barley seed

X (100) grains certified barley seed/ soak for 24 hour/ place on moist filter paper (substrate) in dish/ allow seeds germinate/ up to 6 days (time)/ keep filter paper moist/ count the number germinates when shoots 1cm long/ the number of grains is the germination percentage if 100 seeds used/ calculate percentage 4 (2m)

2001 Marking Scheme

3. (a) (i) Crop rotation – crop put into a different field yearly/ rotation/ to prevent, spread of disease/ spread of pests/ weed control/ improve soil structure/ maintain soil fertility 2m+2m

6. (c) **Name** – Barley/ wheat/ potato/ sugar beet 2m
(mark for one named tillage crop only)

Barley / wheat

(i) pH 6-6.5/ structure: grey brown podzolics/ brown earth's 2m+2m
(ii) plough & harrow 4m
(iii) 10:10:20/ 300 hundred wt/ per ac. Or metric equivalent/ N,P,K, or relevant element named 4m
(iv) 5-7 2m

Potato

(i) pH 5-6/ deep loam 2m+2m

(ii) autumn plough/ harrow/ 12” rough seed bed/ ridges & furrows 4m

(iii) half ton. per ac. K put on as sulphate of potash/ N makes pot watery/ relevant element named 4m

(iv) 30

sugar beet

(i) pH 6.5-7.0/ deep loam 2m+2m

(ii) autumn plough/ harrow/ rotavate/ 6-9” fine seedbed 4m

(iii) NaCl – sea conditions/ B-heart rot/ S/ N:P:K/ relevant element named 4m

(iv) 40-50