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.

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.

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.

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.

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

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.
   (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
   (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.
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.

   [Images of crops C and 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.

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.

   [Diagram of oat plant]

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

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
**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.

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**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.

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**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.

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**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:
nitrogen converted to nitrates/ incorporated into bacteria/ named bacteria/ symbiotic or mutualistic/ named plant sp./ or into soil directly/ by action of lightening First point compulsory 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
(ii) Rotation: Barley: very tolerant of continuous sowing
Potato: 1 year in 4/ last crop before lime
(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
(iv) Yield (tonnes/ha) Barley: 5-7
Potato: 30-40

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

(c) (i) 7-6-17 or 10-10-20
(ii) Too much nitrogen/ delays maturity/ K₂SO₄ 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

2008 Marking Scheme

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

Option One

3. (a) (i) control of pests/ disease/ helps maintain soil structure/ helps maintain organic matter/ weed control/ better farm management/ nutrient balance
(ii) suede or turnip/ fodder beet/ potatoes/ etc. (any root crop)
(iii) matching use – fodder for cattle/ food for humans etc.

(b) yield/ length of straw/ strength of straw (lodging)/ earliness of ripening/ disease resistance/ suitability to locality/ mating quality
(c) (i) fungus/ rotation/ lime soil/ use resistant variety/ drainage/ fungicide
(ii) virus/ control of aphids/ certified seed potatoes
(iii) fungus/ seed treatment (certified seed)/ fungicide
(iv) bacterium/ grow crop in low pH soil/ early irrigation/ resistant varieties/ crop rotation

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

Option Two

3. (a) name [allow potato] 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

(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]
(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

(c) name (e.g. rape, kale, stubble turnip, cabbage, grass, legume, lettuce) 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]
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 \textit{any two} 6m+3m
(ii) crop rotations/ resistant varieties/ harvesting without delay/
  scarecrows/ guns/ bangers/ biological control/ stubble cleaning/
  liming/ netting/ fleece/ autumn ploughing \textit{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 \textit{any four} 4 (3m)

\textbf{2004 Marking Scheme}

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

(f) C = wheat \quad 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 \textit{any one} 4m

(i) to avoid pollution/ to prevent accumulation in food chain/ damage to wildlife/
  residue in crops/ risk to handlers/ to comply with REPS/
affects pollution \textit{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. \textit{any five} 5 (4m)
yield: 2m

(c) (i) \textit{named fungus} (e.g. blight, mildew, rust, \textit{Rhyncosporium}) 4m
  \textbf{effect on growth}: spots or mycelium on leaves/ less photosynthesis/
  feeds on sap/ lower yield/ rotten tubers/ lodging in cereals \textit{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 \textit{any three} 3 (4m)
2003 Marking Scheme

1. (d) 1. Gramineae
   
   2. A = spikelet       B = panicle/ petiole/ stalk

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

6. (a) Named cereal crop

   (1) pH 6-6.5/ deep/ sandy loam/ grey brown podzolics/
       brown earths/ etc. any two
   (2) plough/ harrow/ produce fine seed bed/ etc. any two
   (3) time of sowing/ method/ rate/ etc. depending on
       cereal type any two
   (4) 10:10:20/ N/ P/ K/ or relevant element (s) named/ amount
       of fertiliser related to soil type/ any two
   (5) combine harvester/ time/ yield/ etc. any one

(b) (1) Control of soil-borne diseases/ pests/ maintenance of soil structure/
       of organic matter/ of fertility/ weed control any two
   (2) Disease free/ high germination rate/ high purity type/ free of weed
       seeds/ seed dressing any two

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

Option Two

3. (a) A = Wheat

   B = Oats

   C = Barley

(b) Name of cereal grain storage

   1. Grain Drying/ Moisture content
   2. Acid Treatment
**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

(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  
(ii) autumn plough/ harrow/ 12” rough seed bed/ ridges & furrows  
(iii) half ton. per ac. K put on as sulphate of potash/ N makes pot watery/ relevant element named  
(iv) 30

**sugar beet**

(i) pH 6.5-7.0/ deep loam  
(ii) autumn plough/ harrow/ rotavate/ 6-9” fine seedbed  
(iii) NaCl – sea conditions/ B-heart rot/ S/ N:P:K/ relevant element named  
(iv) 40-50