**AGRICULTURE PAPER 1**

**TERM 3 - FORM 3 2022**

**443/1**

**MARKING SCHEME**

**SECTION A (30 MARKS**)

1. **Sources of soil nutrients**

Parent rock ,

Manure/humus

Inorganic fertilisers

1. **Roles of soil water**

* Solvent for nutrients
* Cooling in plants
* Raw material for photosynthesis

1. **Advantages of compound fertilizer**

* Cheaper and more convenient to apply saving on time, cost and labour
* Balanced in all plant nutrients
* Easy to store as they do not form lumps when stored for long

1. **Effects of high temperature on crop production**.

* Improves quality in some crops such pineapples
* May lead to wilting of crops
* May reduce quality in some crops such grapes
* Leads to faster growth rate
* May increase disease incidences

1. **Ways of improving the structure of sandy soils.**

* Application of organic matter/manure into the soil
* Minimum tillage
* Tilling at the right moisture content
* Crop rotation
* Cover cropping
* Mulching
* Intercropping
* Mixed cropping

1. **Reasons for rolling when planting wheat crop**.

* Makes the seed come into contacts with the soil moisture
* Promote uniform germination of the tiny seeds
* Protect the top soil layer and tiny seeds from being blown away by wind. (any 2x1=2mks)

1. **Information found in a land title deed**

* Name and ID number of farmer
* Date of possession
* Size of land
* Type of ownership
* Sign and seal of registering officer

1. **Types of vegetables**

* Fruit vegetables
* Leaf vegetables
* Stem vegetables
* Flower vegetables

1. **Agents of soil erosion**

* Water
* Wind
* Human activities

(any 3x½ =1½ mks)

1. **Factors influencing soil erosion**

* Topography
* Type of soil
* Soil depth
* Vegetation cover
* Overstocking
* deforestation

1. **Methods of water harvesting in the farm**

* Dams
* Weirs
* Ponds
* Roof catchment
* Rock catchment
* Use of wells

(4x½ =2 mks)

1. **Factors that are considered when selecting a nursery site.**

* Well sheltered place
* Security
* Previous cropping
* Topography
* Nearest to the water source
* Type of the soil.

13. **Difference between intercropping and Monocroping**

Monocroping > growing of one type of crop in a piece of land

Intercropping > growing of two or more crops in a particular piece of land at the same time or the crops take more time growing together

1. **Ways in which consolidation helps to improve farm management.**

* Proper supervision of land
* Economic use of time and saving on transportation cost
* Agricultural advice by extension officer
* Soil conservation and land improvement
* Constructions of permanent structures e.g. fencing and building
* Economic operations of activities
* Weeds, pest and diseases control is enhanced
* Sound farm planning and adoption of crop rotation programme.

1. **Ways in which weeds are classified based on growth cycle**.

* Annual weeds
* Perennial weeds
* Biennial weeds

1. **Functions of the following parts of a knapsack sprayer?**

* **Nozzle**- Atomizes the spray
* **Trigger**- Regulates the spraying
* **Pneumatic** lever – Generates the spraying pressure.

***SECTION B (20 MARKS)***

1. (a) **Name of weed** - Black jack (1mk)

(b) **Reason why it is difficult to control the weed**.

* Produces many seeds
* Has efficient mode of dispersal

(c) **Reasons for controlling the weed in a crop field.**

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To avoid competition for nutrients, moisture and light

- Its seeds may affect the quality of Agricultural produce e.g. wool

- May irritate workers in the farm

- Prick and irritate workers

(2 x 1 = 2mks)

(d) **Stage of growth at which the weed should be controlled using a post emergence herbicide**

- 10 – 15cm high

- 2 – 4 weeks after emergence

- Before flowiling

-**Reason** = it has not produced seed which may geminate to new weeds

1. i) **Name of method of soil conservation illustrated**

* Cut –off drain/diversion ditch (1x1=1mk)

ii) **Ways of strengthening the embankment at the lower side of the diagram**

* Planting of trees
* Planting of grass

(2x1=2 mks)

iii) **Areas into which the water collected above is discharged**

* Into an artificial water way
* Into a natural water way such river
* Onto non-erodable stony or rock ground
* Onto grassland with well-established grass cover.

1. a) **Name of the pests** **illustrated**

* **P** – Locust **Q** – Armyworm  **R** - Cut worms  **S -**  Ballworm

b) **Kind of mouth part in the above pests**

* Biting and chewing mouth parts

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1. **Ways in which pests can be classified depending on their habitat**

* Field pests
* Storage pests

1. **Methods that can be used to control the pests**

Use of appropriate insecticide

Use of certified seeds

Crop rotation

(1x1=1mk)

**SECTION C (4O MARKS)**

1. a) ***Harmful Effects of Weeds***

* Weeds compete with crops for nutrients, space, light and soil moisture.
* Some weeds, for example, *Striga spp* are parasitic to cultivated crops such as maize.
* Some weeds lower the quality of agricultural produce for example:
* Mexican marigold gives undesirable flavour to milk if dairy cows feed on it.
* Devils horsewhip, black jack, bristly fox-tail and others get attached to sheep wool thus lowering its quality.
* Some weeds are poisonous to human beings and livestock for example:
* Thorn apple *(Datura stramonium)*
* Sodom apple *(Solanum incanum)*
* Some weeds have allelopathic effects to cultivated crops.
* Water weeds block irrigation channels.
* Aquatic weeds such as Salvinia in Lake Naivasha and water hyacinth in Lake Victoria affect fishing.
* Some weeds are alternate hosts for insects, pests and disease causing organisms for example:
* Wild oat *(avena fatua)* is an alternate host for rusts.
* Mallow *(malva verticillata)* is an alternate host for cotton stainers.
* Weeds lower the quality of pasture for example:
* Tickberry *(Lantana camara)*
* Nut grass *(Cyperus rotundus),*
* Manyatta grass *(Eleusine jaegeri)*
* Some weeds irritate workers thus reducing the efficiency in which they are controlled for example:
* Double thorn *(Oxygonum sinuatum),*
* Stinging nettle *(Urtica massaica)* ,
* Devil's horse whip *(Achyranthes aspera).*

b) ***Harmful Effects of Crop Pests***

* Pests such as squirrels and rodents, unearth planted seeds, resulting in poor germination.
* Some pests like nematodes, termites and moles damage crop roots causing wilting and death of the crops.
* They lower the quality and quantity of farm produce.
* They increase the cost of production since farmers will incur expenses in purchasing chemicals to control them.
* They transmit diseases to crops for example, aphids transmit streak virus disease in maize.
* Chemicals used to control the pests cause pollution to the environment.
* They exterminate the crop by feeding on them for example eating embryo of the seed.

1. i. a) **Tomatoes *varieties***

* ***Fresh market varieties***:
* Money maker,
* Marglobe, hundred fold,
* Beef eater,
* Hot set,
* Super marmande
* Ponderosa.
* ***Processing varieties***:
* Kenya beauty,
* San -marzano,
* Roma,
* Heinz 13S0,
* Primabel,
* Rutgers hybrid
* **Cal-J**

b) ***Transplanting***

* Done in the morning, late evening or on a humid day
* Health and vigorously growing seedlings should be lifted using a garden trowel
* Seedlings to be planted to the depth they were in the nursery

ii**) Field management practices**

* **Mulching-**smothers weeds and to conserve soil water
* **Gapping** – to attain the correct crop population and increase productivity
* **Weeding-** to encourage health growth of crops
* **Top-dressing** – encourages vegetative growth and fruit formation since nitrogenous fertilizers are used
* **Irrigation** – during the dry season to facilitate faster growth
* **Pest and disease control** – To improve quality of produce, appropriate method should be used
* **Staking** – To prevent disease control and encourage harvesting of clean fruits
* **Prunin**g – it controls cropping, encourages production of quality fruits and makes it easier to carry out other field management practices. (any 6x2=12mks)

iii**) Harvesting and marketing**

harvesting time/stage depends on the use of the tomato fruit. Fruits for processing should be harvested after ripening on the plant while those for local consumption should be harvested when ripening starts. The tomatoes are then packed in wooden crates and transported to market places

* (any 3x1=3 mks)

1. a)

* **Soil fertility**-materials derived from fertile origins end up in different destination
* **Creation of lakes**- moulds or blocks of rocks have dammed rivers courses causing temporarily lakes
* **Damaging property and causing loss of life** e.g. farmland, buildings, homes, lines of communications/transport routes/loss of life.
* **Soil erosion**-on steep slopes
* **Permanent scars on landscape**-No support for vegetation and remain unattractive.
* **Tourist attraction**-e.g. weeping rocks of Kakamega or kit Mikai in Seme, Kisumu County

(Any 6x1=6mks)

b). ***Biological or Cultural Control Measures***

***These measures are applicable where land slope is between 2-12%.***

* ***Grass strips/filter strips***;
  + These are narrow uncultivated strips along the contour left between cultivated strips.
* ***Cover cropping*** ;
* The establishment of a crop that spreads out over the surface of the soil to provide it with a cover.
* ***Contour farming*** ;
* Carrying out all land operations along the contour.
* ***Mulching*** ;
* Covering of the soil with either organic or synthetic materials.
* ***Proper cropping systems*** such as:
* Crop rotation
* Correct spacing
* Inter-cropping
* Ridging/furrowing
* Strip cropping
* ***Controlled grazing***;
* Proper stocking rate, rotational grazing.
* ***Strip cropping***;
* Growing crops which give little ground cover in alternate strips with crops such as beans which have a good ground cover.
* ***Afforestation/re-afforestation***.
* ***Afforestation*** - growing of trees where non-existed.
* ***Re-afforestation*** - growing of trees where they have been cut down.
* ***Agroforestry*** - land use that involves the growing of trees in combination with crops and pastures on the same piece of land