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HORT-232 2.(1+1)
Prodⁿ Techn of vegetables 40 mark
and Flowers.

Que-1] Define Vegetable, write in detail. Importance and Scope of vegetable cultivation in India:

– • Vegetable:-

Any part of crop consumed as fresh or after cooking is called as vegetable.

• Importance:-

(1) Nutrition:-

• Veg. are rich & comparatively cheaper source of vitamins

• Veg. are good source of CHO (Potato, sweet) Proteins (Pea, bean), Vit A (carrot & tomato), Vit B. (Pea & garlic), Vit C. (green chilli), minerals (leafy veg.).

(2) Importance as Food:-

• It is essential to sustain increased prodⁿ besides nutritional standard of people.

• Yield of veg. crop is 4 to 10 times more than cereals. Thus, Veg. play a vital role in Food Production as they are cheapest source of natural Food.

(3) Importance to a grower:-

• Farmer can grow veg. throughout the year for regular income.

• It is short duration crop grown in rainfed areas also it improves soil & provide Fodder to cattle.

(4) Employment :-

• Veg. crops involve different cultural operations from sowing to marketing.

• It provide more & regular income and employment in rural areas.

(5) Industrial Importance :-

• Growth of veg. industry depends on enterprizes like storage, processing, marketing & maintainance

• Due to perishable nature of veg. they needs storage, canning, processing etc.

(6) Importance of Veg. In Farmer's economy :-

• Veg. are Imp source of farm income.

• Per acre yield of veg. is very high.

• more veg. can be raised in one year.

(7) Imp. of Veg. Production ~~not~~ For medical Prop :-

• many vegetable ~~d~~Posses medical value for curing certain diseases.

• many Solanaceae & cucurbitaceae veg. posses Vit. D.

• onion & garlic posses anti bacterial Property.

• Scope of Vegetable growing In India :-

(i) Eating habits of Indian man.

(ii) Area under veg. crops.

(iii) Higher Yield From veg. crop.

(iv) Present agricultural Policies.

(v) Increase in literacy rate of our country.
(vi) Due to construction of new Irrigation Projects.
(vii) Due to Increase in Fertilizer Industries & their Capacity of Production.
(viii) Innovation of new Varieties.
(ix) Availability of cold storage facility.
(x) Increase in transportation facility.
(xi) Due to availability of cold storage facility.

que- 2] Enlist types of Vegetable gardens Explain any one:

- Different Types of Vegetable garden:-
  - (01) Home or Kitchen or amateur gardening.
  - (02) Commercial Vegetable gardening:-
    - (i) market gardening.
    - (ii) Truck gardening or Farming.
    - (iii) Vegetable forcing.
    - (iv) Vegetable for Processing → (i) canning, (ii) Freezing (iii) Dehydration (iv) Pickling & Fermentation.
    - (v) Veg. gardening for Seed Production.
    - (vi) Floating Vegetable gardening.

- Market gardening:-

- It is branch of veg. growing whose object is to produce veg. for local market.
- Gardens are located 10-15 miles in vicinity of city area.
- As gardens are located near city area the cost of land, labour is high.
- For market gardening crops like leafy veg, cabbage, caulflower, tomato, chilli, etc.
- Short duration & ~~early~~ high yielding varieties are used to catch early market & get mar. return

Que-3] Enlist different types of vegetables classification & write in brief about classification on basis of plant part consumed:

- 01) Botanical or taxonomical classification.
  2) Classification based on: hardness.
  3) —"— plant part used for consumption.
  4) —"— cultural requirement / method of cultivation.
  5) —"— season of cultivation.
  6) —"— salt tolerance.
  7) —"— Rate of respiration.

• Based on plant part consumed:-
  1) Leafy (Leaf) Vegetable → Amaranthus, Palak, Fenugreek.
  2) Under (Root) ground veg → Raddish, carrot, onion, garlic.
  3) Fruit → Tomato, chilli, brinjal, okra, Peas.
  4) Flower → Cauliflower, Brussel's Sprout.
  5) Tuber → Potato, Sweet Potato.

• Based on method of culture:-
  1) Perennial veg. - Asparagus, Parwal, Tondali.
  2) Greens - Spinach.
  3) Saled crops - Lettuce, celery.
  4) Cole crops. - Cabbage, Cauliflower.
  5) Bulb crops - Onion, garlic.
  6) Root crops - Carrot, raddish.
  7) Tuber - Potato, Sweet Potato.
  8) Peas & beans - Cluster bean, cowpea.
  9) Solancious - Tomato, brinjal chilli.
  10) Cucurbits - Watermelon, cucumber.

Que-4] Write in detail cultivation of chilli:

BN→ Capscicum annum L. F→ solanaceae.

Ⓐ Soil & Climate:-

soil= • Req. Sandy loam to clay loam.
• well drained, areated, Acidic soil is not suitable.

climate= • Tropical & subtropical.
• Req warm & humid region, Temp:-20-25°C.

Ⓑ Seed rate & Sowing:-

Seed rate:- 1kg/ha. layout:- Ridges & furrow.

Spacing :- Rainfed - 60 x 45cm.
Irrigated - 60 x 60cm.

Sowing time:- Kharif - may- June.
summer - January.

Ⓒ Improved Varieties:-

i) Agnirekha.
ii) musalwadi.
iii) Phule Jyoti.
iv) Phule mukta, sai
v) NP-46
vi) Jwala.

Rahuri

Ⓓ Transplanting:-

(i) Seedling will be ready for transplanting in 45 days after sowing.

(ii) on the day of transplanting deep the Seedling for 5 min in Azospirillum in 1 lit water.

(iii)

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Ⓔ manures & Fertilizers:-
• 9-10 tonn/ha FYm. at field Preparation.

Ⓕ Irrigation:- 1st Irri. :- after transplanting.
After :- 5-7 days interval.
7-10 days interval :- winter.

Ⓖ Harvesting & Yield:-
• Harvesting done - Purely green.
Yield :- Rainfed - 200-400 Kg/acre.
Irrigated - 600-1000 Kg/acre.

Ⓗ Pests & Diseases:-
Pest :- i) chilli thries ii) Pod borer iii) Aphids.
Disease :- i) Damping off ii) Bacterial leaf Spot.

Que- 5) Write in brief cultivation of cauliflower :-

BN → Brassica oleracea var. botrytis L. F → cruciferae.

(A) Soil & climate :-

Soil = • Req. rich in nutrients, adequate moisture, good drainage & it should contain organic matter.

• Sandy loam (early) and clay loam (late).

• PH = 6.0 - 7.0.

Climate = • Grow best in cool & moist climate.

• Temp = 50 - 70°F required.

(B) Intercultural operations : (Blanching) :- (Short note)

i) Blanching is an essential operation to protect heads from sun burning & yellowing

ii) This operation may be done by drawing & tiening the tips of leaves when heads are formed.

iii) After transplantation blanching should be only done when head has fully grown, This process known as blanching.

(C) Fertilizers management :-

• 15 - 20 tonnes FYm/ha.

• 100 : 50 : 50 NPK kg/ha.

(D) Seed & Sowing :-

Seed rate :- • 600 - 750 gm/ha for early varieties.

• 400 - 500 gm/ha — late —.

Spacing :- Ridges & Furrow.

45 x 45 cm For early crop.

60 x 60 cm For late —.

Transplanting from nursary bed after 3-4 weeks of sowing.

Ⓔ Varieties :-

i) Pusa Katki
ii) Pusa Deepali
iii) Snow ball.
iv) Pusa shubhra.

Ⓕ Harvesting & Yield :-

Harvesting :- Harvested by picking method.
Harvested when curds are well developed.

Yield :- 200-250 qtl/ha — early crops.
250-300 qtl/ha — in late crops.

Ⓖ Physiological disorders :-

i) Buttoning.
ii) Ricyness.
iii) Browning.
iv) Blindness.
v) whiptail.

Whiptail :- (short note).

i) caused due to molebdenum deficience.
ii) Young plants turn white perticularly along leaf margins & also become cupped & whiter & dies.
iii) Apply molebdenum to control it.
iv) Leaf blade do not develope properly, only midril develop.

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Que-6] Write in brief cultivation of Potato:-

BN → Solanum tuberosum L. F → Solanaceae.

(A) Soil & climate:-

Soil = • Deep, Fertile, Sandy to clay loam with good water holding capacity.
• Req. good aerated soil.

climate = • cool season crop & moderately tolerant to frost.
• Temp 18-30°C.

(B) Intercultural operations:-

(a) earthing up: Giving Support of Stakes to wines.

(b) Dehaulming :-

• Removal of top portion of potato in seed crop, to avoid spreading of virus carrying insects, vector called-
• It should be done either by cutting or killed by herbicides. eg. paraphoid. (seed treatment).

(C) Improved varieties:-

i) Kurfi Sindhuri.
ii) Kurfi Dewa
iii) Kurfi Lalima
iv) Kurfi Jyoti.
v) Kurfi Bahar
vi) Kurfi Ashoka.

(D) Harvesting & Yield:-

Harvesting = • Harvested when wines are dry.
• Harvested when by digging.
• Kept in shed after harvesting.

Yield = 20-25 tonnes/ha.

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(E) Nutritional values:-

i) Potatoes are Imp. Staple Food crop.

ii) Potatoes are used alone & mixed with meat, fish, chicken & other vegetables.

iii) In big cities, and town - Potato chips are prepare and sold commercially.

iv) Potato is rich in starch & contains proteins, minerals & a fair amount of vitamins, perticularly in vit

(F) Seed & sowing:-

Sowing time:- 25 Sept - 10 Oct.

Spacing:- Hilly - 60x30, planted in Furrows.

Plain - 30cm apart —"— ridges.

Seed rate:- 800-1000 kg/ha.

~~Man~~

(G) Fertilizer & manures:-

• 30 tonn/ha FYM

Irrigation :- Frequent Irrigation.

1st Irrigation :- after sowing, one week Intervals.

(H) Pest & diseases:-

Pest = Aphids, Leafy hopper, Cut worms.

Diseases = Late Blight :- Fungal.

Early Blight :- —"—

Bacterial Wilt :-

Que-7] Write in detail cultivation of okra:-

BN→ Abelmoschus esculentus L. F→ malNaceae.

(A) Soil & Climate:-

Soil:- • Sandy loam & clay loam - best.
• PH = 6.0-6.8.
• Land is prepared by 1-2 ploughing.

climate:- • warm season crop.
• Highly sensitive to frost.
• Temp req. more than 20°C.

(B) Seed & Sowing:-

Seed rate:- 8-10 kg/ha - rainy season.
12-15 kg/ha - Summer —.

Sowing time:- Kharif :- June-July.
Summer:- Jan-Feb
Winter:- Aug-Sept.

Layout:- Ridges & Furrow.

Spacing:- Summer = 45x30 cm.
Rainy = 60x45 cm.

(C) Improved Varieties:-

i) Phule Kirti - MPKV Rahuri
ii) Pusa makhamali
iii) Pusa sawani
iv) Parbhani Kranti.
v) Padmini
vi) Arka anamika.

(D) manures & fertilizers:-

• 20-25 tonn/ha - FYm.
• 100 kg N, 50kg P_2O_5,
• 50 kg K_2O.

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Irrigation :- 1st Irri. :- Just after sowing.
After 4-5 days :- In summer.
8-10 days :- In winter.

(E) Harvesting & Yield :-
(a) Harvesting = Fruit ready to harvest :- After 3-5 days after Flowering.
Flowering :- 35-40 days after sowing.
(b) Yield :- 7500 kg/ha — rainy.
5000 kg/ha — summer.
crop duration :- 90-100 days respectively...

(F) Pests & Diseases :-
Pests = Stem & Fruit borer, Jassids.
Diseases = · Yellow vein mosaic.
· Die back.

Que-8] Write in detail cultivation of Tomato:

– BN→ Lycoperscion esculentum mill. f→ Solanaceae.

Ⓐ Soil & Climate:-

Soil: • Well drained, sandy loam soil.
• Soil should be well prepared & levelled by ploughing the land 4-5 times.
• pH = 6.0-7.0 - best.

Climate: • warm season crop, warm, sunny weather is most suited.
• opt. temp for seed germination = 26-32°C.
——"—— cultivation = 15-27°C.

Ⓑ Seed & Sowing:-

Sowing time:- Kharif-crop- May-June.
• Rabi crop - Aug-sept.
Summer - Dec-Jan.

Seed rate:- 500-600gm/ha.

Transplanting:- After 3-4 weeks old.

Spacing:- 60-75x60cm.

Layout:- Ridges & furrow.

Ⓒ Improved Varieties:-

i) Bhagyashree — (MPKV Rahuri).
ii) Phanashree — (MPKV Rahuri).
iii) marglobe, Pusa Rubi.
iv) Sioux, Punjabi chohra.
v) Phule Raja.

• Intercultural operations:-

i) Training ii) Pruning iii) Staking.

Ⓓ manuring & Fertilizers :-

- 30 to 50 cartloads of FYM.
- 100 : 50 : 50 NPK Kg/ha.

Irrigation = 2-3 times in month — Rainy season.
7-10 — — — Winter
Twice a week — Summer

Ⓔ Harvesting & Yield :-

ⓐ Harvesting :- • Grasping by hand.
• Dislodging From vine by twisting.
• Keeping thumb pressed.

(1) Green stage :- - Fortnight before developing redness trace at styler fruit dev. normal vine color
- Sent to distant market.

(2) Pink Stage :- Red/Pink colour on surface.
not Full riped :- Picked for local market.

(3) Ripe Stage :- mast Fruits are red.
Fruit softening Starts.
Picked for home/table use.

(4) Fully Ripe :- • Feel soft, Starch changed into sugar
• Used for canning, Pickling within 24 hrs

Yield :- • 500-1000 qtl/ha. — hybrid.
160-200 quintal/ha —

Duration :- 160-180 days.

Ⓕ Nutritional & medicinal value :-

ⓐ Nutritional :- • Contains considerable amount of Ca & Vit. K & provide antioxidants.
• It contains sugar & starch.

ⓑ medicinal :- • Good For skin, helps to prevent several types of cancer. Lycopene is natural anti-oxidant
• Good For heart, diabetles, BP lowers, Colesterol, natural sunscream.

Que-9] Write in detail cultivation of Rose:

– BN→ Rosa indica f→ Rosaceae.

Ⓐ classes & classification:-

A) old garden Roses or wild Roses:-

i) European x wild roses &

ii) Asian / china rose x wild roses.

B) modern garden roses:-

i) Hybrid Tea. (HT).

ii) Floribunda.

iii) miniature.

iv) Polyantha.

v) Ramblers.

vi) creepers / climbers.

vii) Shrubs.

Ⓑ Propogation:-

Commercial methods of Propogation:-

1) Cutting:- Rootstocks of modern roses, miniatures, shrub, climbers & rambler are usually propagated by cutting (stem cutting).

2) By budding:- Hybrid Teas & Floribunda are multiplied by shield budding. Their most favourable season is winter season i.e. oct-Jan.

Rootstocks:- i) Rosa multiflora.

ii) Rosa Indica var. odorata.

iii) Rosa € dwarf.

© Planting & methods:-

Planting:- •45cm width & 60 cm depth (Pits).

•Filled with FYM + sand + bone meal.

(D) Spacing :- (a) Hy: Tea - 120 x 120 cm.
(b) Floribunda - 60 x 90 cm.
(c) miniature - 30 x 60 cm.
(d) climbers - 90 x 120 cm.

(D) Harvesting & Yield :-
*Harvesting :- • Harvested when 2 Petals are opened for local markets
• For distant markets - Flower are harvested in tight bud stage.
• Roses are graded as follows on Stem length bas is :- i) 60 cm ii) 45-60 cm iii) 30-45 cm.
*Yield :- In 2nd year - 30-40 Flowers / Plant.
From 3rd Year - 50-60 Flowers / Plant.
Avg. Yield = 1.5 - 2 lakh Flower / ha.

(E) Soil & climate :-
Soil = • Req Fertile loamy soil.
• Deep soil having molsture holding capa. with poor drainage.
• Susceptible to water lodging.
climate = • Plenty of sunshine req.
• Disease & Pests occured when kept in Shade

(F) Varieties :-
i) Superstar (Red)
ii) Sonia, Queen Elizabeth (Pink).
iii) Tushar, Iceberg (white).
iv) Ganga, Honeymoon (Yellow).

(g) Disbudding :-

i) It is practise of removing of undesirab buds

ii) It is type of pruning done for producing a single large flower at top of cane or forming a more uniform spray.

iii) It is necessary for obtaining quality flowers for commercial purpose.

iv) It helps to achieve the largest flower.

(H)

Que-10] Write in detail cultivation of BRINJAL /EGG PLANT

BN→ Solanum melongena L. F→ Solanaceae.

Ⓐ Soil & climate:-

Soil:- • Can be grown on diff soils.

• Grows well in fine, rich, deep well drained, loam s

• PH= 5.5-6

• Long dwarf crop: soil should be well ploughed

Ⓑ Seed & Sowing:-

Sowing time:- • Binneial crop:- Grow twice in year.

• may-Jun, Aug-Septe, Dec-Jan.

Seed rate:- 600-700 gm/ha.

Spacing:- 75 x 60 cm to 75 x 75 cm.

layout:- Ridges & Furrow.

Ⓒ Varieties:-

i) Krishna (MPKV Rahuri).

ii) Phule harit (MPKV Rahuri).

iii) manjari gota (——,,——)

iv) Pusa purple long.

Ⓓ manures & fertilizers:- • 30-50 cartloads FYM.

• 100:50:50 NPK kg/ha.

Irrigation:- Summer- Every 3rd-4th day.

winter - Every 7th-10th day.

Ⓔ Harvesting & Yield:-

• Cutting by small knife.

• Harvested when immature good sized.

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Yield :- 250 - 300 q/l/ha.

(F) Disease & Pest :-

(i) Brinjal Fruit - Shoot borer :- Demicron (cure) - 100 Ec.
@ 0.8 ml.

(ii) Brinjal Stem borer :- ——— " ———

(iii) Nematode :- Methyl Parathion.

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Objectives – 08 mark

Que-1] Do as directed :

(01) Rose is a national Flower of which countries. (USA & IRAN)

(02) Spell out abbreviation of IIVR : (Indian Institute of Veg. Research).

(3) Konkan Ashwini is the name of Sweet potato variety released by Dr. BSKKV, Dapoli.

(4) Where is Lalbagh botanical garden is located → (Bangalore Karnataka).

(5) Two Potato varieties Suitable for Processing : (i) Kufri Alankar, (ii) Kufri Laukar.

(6) Two dioecious cucurbits → watermelon & musk melon.

(7) Two examples of hedges → (Duranta, Kanchan).

(8) Two ex. for Indore gardening :- (Aralia, Anthurium).

(9) Two ex. of commercial Flowers propagated by → Tuberose, marigold,

que- 2] Fill in the blanks:-

(01) Separation of stalk from vine with slight jerk is maturity indices of (muskmelon) crop.

(2) Turning of vines is Interculture operation in Sweet Potato Veg. crops.

(3) Greening of potato is due to Solanin.

(4) Red colour of tomato is due to Lycopene pigment.

(5) BN - Potato = Solanum tuberosum.

(6) BN - muskmelon = Cucumis melo.

(7) Family of Gerbera = Compositeae.

(8) Tuberose is propagated by Bulb.

(9) BN - mogra = Jasminum Sambac.

(10) Kitchen gardening is extensive type of vegetable cultivation.

(11) Red colour of chilli is due to capsanthin.

(12) (methi) is a leguminous leafy vegetable.

Que-3] Match the Pairs:

(01) marigold :- Tagets species.
(2) Sweet Potato :- Konkan Ashwini.
(3) Jasmine :- oleaceae.
(4) Garlic :- Godavari.
(5) Indian bean :- Dipali.

(6) Bougainvillea :- climber
(7) Sponge gourd :- Pusa chikni.
(8) Dolichos bean :- Konkan Bhushan.
(9) chrysanthemum :- Disbudding.
(10). Celery :- Salad veg.

Crop — Plant Part used for Propagatio
(01) Tuberose :- Bulb
(02) Garlic :- Corms
(03) Spinach :- Seed
(04) Drumstick :- Seed.

(11) Amaranthus :- Leafy veg.
(12) Pothos Species :- Hanging Basket.
(13) Drooping Ashok :- Avenue tree.
(14) Broccoli : Anti cancer Vegetable

(15) Bitter gourd :- cheratin.
(16). Tuberose bulbs :- Lycorine.
(17) Indoor plant :- Dieffenbachia.

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que-4) Define the Following Terms:

(01) Staking :-

'Providing support to plant with help of bamboo sticks, keeping stem straight' Ex. Tomato.

(2) Pinching :-

'Removal of growing point of a shoot along with few leaves. Ex. marigold.'

(3) Disbudding :-

'Removal of all buds except one or two stems. obj. of disbudding is to get large size, quality blooms over a long period by discouranging the development of lateral shoots.'

(4)