MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD,
PUNE
SEMESTER END EXAMINATION ANSWER SHEET
B. Sc. (Hort.)

Semester	:	III (New)	Academic year	:	2017-18
Course No	:	H/VS-231	Title	:	Tropical and Subtropical Vegetables and Tuber crops
Credits	:	3 (2 + 1)	Total marks	:	80
Day & date	:		Time	:	

SECTION 'A'

Q. 1 Write in detail about the importance of tropical and subtropical vegetables crops.

Ans. The following points should be covered

- Importance in Indian economy being second largest producer of the world.
- Nutritive importance as it provides CHO, fat, protein, vitamins and minerals.
- Employment generation potential.
- Industrial importance like seed production and seed processing
- Quick returns as compared to other crops.
- More number of crops can be grown in a year.
- Yield per unit area is more
- Some vegetable crops are having medicinal properties.
- Vegetables are major export earner to the country.
- Cultivation of leguminous vegetables improve soil fertility.

Q. 2 Write about cultivation of okra on the following aspects.

Ans. 1. Soil and Climate – Requires warm and humid climate, susceptible to frost, Temperature required is 18-35^{0}C, Not grown in cool winter. Soil – Loose, friable, well manured, well drained soils.

2. Seed rate and spacing –

Season	Seed rate	Spacing
Rainy	8-10 kg / ha	60 cm x 30 cm
Summer	15-20 kg / ha	45 cm x 30 cm

3. Manures & fertilizers – Varies according to soil fertility 20-25 ton FYM / ha, 100 kg N, 50 kg P and 50 kg K per ha is given for optimum yield, ½ N, full P and K is

given as basal dose with all FYM. Remaining ½ N is given in two splits at 30 and 60 days after planting.

4. Harvesting & yield – Harvesting started 45 days after planting, full grown tender pods are harvested. At least 3 harvestings in a week are done.

Yield – 150 – 200 Q/ ha. Rainy season, 100-200 Q/ha – Summer season.

Q. 3 Write about cultivation of chilli on following aspects.

Ans. 1. Soil & climate – Cultivated as rainfed and irrigation crop. Requires warm and humid climate, Susceptible to frost, Optimum temperature range – 20-25^{0}C. Soil – Various types of soils are suitable which are well drained. Susceptible to water stagnation.

2. Seed rate and spacing – 750 gm / ha – Improved varieties, 350-400 gm / ha – F1 hybrids. Spacing- Dwarf varieties – 60 cm x 45 cm, Tall varieties – 75 cm x 60 cm and 75 cm x 75 cm.

3. Varieties (any two) – Pusa Jwala, NP – 46 A, Punjab Lal, Solan Yellow, Agnirekha, Tejasvini, Konkan Kirti, Byadgi, Sankeshwari – 32.

4. Yield (Green and dry red chillies) – Green chillies – 10 – 12 t / ha., Dry red – 1.8 to 2.5 t / ha.

Q. 4 Write short notes on

Ans. 1. Varieties of tomato - Depending upon growth habit tomato varieties are classified as Determinate, Indeterminate and semi determinate varieties. Determinate varieties are characterised by dwarf growth habit where as indeterminate varieties are characterised by viny growth habit and requires systematic staking for proper growth.

Determinate varieties - Roma, Rupali, Pusa eary Dwarf, Hisar arun, Hisar Lalit, Sonali, Arka Alok, Arka ABha etc.

Indeterminate varieties - Pusa Uphar, Solan Gola, Sioux, Marglobe, Shalimar - 1, Shalimar - 2, Pusa ruby, Arka Vikas, Dhanashree etc.

2. Maturity indices of watermelon. - Takes 45 – 50 days from anthesis to maturity. Appearance of dull sound as against metallic sound in raw fruits. Spot where fruit touch the ground turns yellow. Weathering of tendril near fruit axil.

Q. 5 Describe in brief the cultivation practices of Brinjal on following points.

Ans. 1. Soil & climate – Can be grown on light sandy to heavy clay loam, generally silt loam to clay loam are preferred, with good fertility and drainage with pH 5.5 – 6.0.

Climate – Long and warm growing season in desirable daily mean temperature of 13 to 30^{0}C is favorable for satisfactory yield.

2. Manures & Fertilizers – FYM 20-25 t / ha and Fertilizer 150:50:50 kg. NPK / ha, full dose of P and K and half dose of N should be given at the time of planting and remaining half dose should be supply in two equal splits at 30 and 60 days after transplanting.

3. Planting season & seed rate – 400 to 500 g / ha Planting method ridges and furrow, flat bed method. Spacing – 60 cm x 45 cm and 45 cm x 45 cm and 60 x 60 cm.

4. Improved varieties – Arka Kusumakar, Arka Nidhi, Pusa Purple Round, Pusa Purple Long, Arka Nilkanth, Mangri Gota, Vaishai, Pragati, Krishna, Phule Arjuna, Suvarna Prathibha.

Q. 6 Write about cultivation of cucumber in respect of following aspects.

Ans. 1. Soil & climate – Warm season crop, grown in tropical and subtropical region. When light intensity, duration and temperature is high, it flavors production of male flowers. It grows best at temperature range of 18-24^{0}C. Soil – Well drained loamy soils are best. Light soils with good drainage are suitable for early crop. pH – 5.5 to 6.8.

2. Use of growth regulators – Spraying of ethrel 250 ppm at early vegetative stage preferably at 2 to 4 true leaf stage increases number of female flowers. Gynoecious lines can be maintained by inducing maleness by spraying of gibbrellic acid at higher concentration.

3. Manures & fertilizers – FYM 20-25 t/ha. Chemical fertilizer requirements changes as per fertility of soil. Fertilizer dose of 135 kg N, 60 kg P and 30 kg K has been recommended by DBSKKV, Dapoli. Half N and full P&K should be given as basal dose remaining half N is given in two splits at 1 and 2 months after planting.

4. Harvesting & yield – Tender fruits before seed become hard are harvested. Harvesting starts after 45 – 50 days of planting. Frequent harvestings are done. Grading as per size shape and tenderness should be done before marketing. Yield – 25 – 30 t/ha.

Vigna unguiculata

Q. 7 Write about cultivation of cowpea in respect of following points.

Ans. 1. Soil & climate - Cowpea can be grown almost in any type of soil but well-drained loam or slightly heavy soils are better. Saline or alkaline soils are not good. Is is a

warm season crop and can be grown in all tropical and subtropical areas. It can tolerant drought to some extent but cannot tolerate water logging. The germination is better at 12 – 15^{0}C temperature and the crop thrives best between 21-35^{0}C temperatures. Frost is harmful to this crop.

2. Seed rate and spacing – It is propagated by seed. Seed rate for bushy types - 50 to 60 kg per ha. Where as for viny types seed rate is 12-15 kg / ha. Spacing – For bushy type 30 x 15 cm OR 45 x 30 cm. For viny types - 90 x 60 cm OR 90 x 90 cm.

3. Planting season – Cowpea is grown during rainy and summer season. For rainy season sowing should be done in month June-July and for summer crop sowing in February – March.

4. Harvesting & yield – The pods are harvested when adequately developed and are tender. Picking of pods 15 days after pod setting is ideal foe vegetable purpose. The harvesting starts from 45 – 50 days in early cultivars which may continue up to 100 days. Grain crop matures in 75-125 days. Yield - Green pods 80-100 q/ha and grain – 12-15 q/ha.

Q. 8 Describe in brief the cultivation practices of sweet potato on following points.

Ans. 1. Soil & climate - Moderately warm climate and temperature of 21-26^{0}C is very conducive to sweet potato cultivation. It is widely grown in tropical, subtropical and warm temperate areas. A well distributed annual rainfall of 75-150 cm is favorable for its cultivation. Even slight frost and temperature below 10^{0}C check its growth and development of tubers. Well drained loam and clay loam soils are good for sweet potato. Sandy loam with clay sub-soil is ideal. Heavy clay reduces its yield due to poor aeration. Soil pH -5.2-6.7.

2. Propagation & raising of nursery – Sweet potato generally propagated by fresh vine cuttings, directly obtained from field. To get sufficient planting material, nurseries are raised from selected tubers. Vines obtained from freshly-harvested tubers are also planted in nursery to get planting materials. To plant one ha crop, 500m^2 secondary nursery is required. Vine cuttings (20-30 cm long) obtained from top and middle portions having 3-4 nodes are ideal for planting. These cuttings should be stored in shade for 2 days to ensure better establishment in the field.

3. Turning of vines - It should be turned to avoid anchoring the soil at nodes 30 days after planting. This is essential to check vegetative growth and to enhance tuber yield. The turning of vines should also be done at the time of second interculture to

check luxuriant growth. Pruning of 15 cm of top vine 60 days after planting does not affect the yield.

4. Harvesting & yield – Sweet potato matures $3^{1/2}$ to $4^{1/2}$ months after planting. Harvesting sweet potato 120 days after planting is normally recommended. Delay in harvesting invites attack of sweet potato weevil. By adopting recommended varieties and improved cultural practices, a yield up to 30 tonnes/ha may be obtained.

Q. 9 Enlist various types of vegetable gardens and write about one which is aimed for production of seed.

Ans. Various types of vegetable gardens -

1. Kitchen garden
2. Processing garden
3. Market garden
4. Seed production garden
5. Truck garden
6. Floating garden
7. Forcing garden

Aimed for production of seed is seed production gardening –

1. Highly specialized farming
2. Cultivation for seed production purpose
3. Practiced on commercially large scale.
4. Selection site is important for setting seed.
5. Rouging, field inspection, isolation distance is to be followed.
6. Rearing of honey bee increases the yield.
7. Crop duration is usually more.

Q. 10 Write in brief the cultivation practices of bitter gourd on following points.

Ans. 1. Soil & climate - Loam and silty loam soil is more suitable for its cultivation. It grows well on silty soil on river beds. The land should be well prepared. Climate – Hot and moist weather is favourable for its growth and development. Low temperature inhibit the germination of seeds. It grow best at temperatures between 18-24^{0}C.

2. Time of sowing & seed rate - The seed is sown from January to March for summer season crop. June – July for rainy season crop in the plains and March to June in the hills. Seed rate – The seed rate is 4 to 5 kg / ha.

3. Manuring - The doses of manures and fertilizers depend upon the soil type, climate and variety. About 250 to 300 quintals of form yard manure should be added during soil preparation. Besides this 60 kg nitrogen, 80 kg phosphorus and 60 kg

potash per ha should be applied in the form of chemical fertilizers. Full dose of phosphorus and potash and half dose of nitrogen should be given as basal whereas rest half dose nitrogen should be given as top dressing in two splits, first 25 to 30 days after sowing and second at flowering stage.

4. Harvesting & yield – Harvesting is done when the fruits are still young and tender at every alternate day. Picking should be done carefully so that the vine may not be damaged. The fruits should not be allowed to mature on the vines. The harvested fruits may be stored for 3-4 days in cool condition. Yield – The yield is 100 to 120 q/ha.

SECTION 'B'

Q. 11 Furnish the information in tabular form

Ans.

Sr. No.	Crop	Botanical name	Plant part used for propagation
1	Lesser yam	*Dioscorea esculenta*	Tuber
2	Methi	*Trigonelle foenum graecum*	seeds
3	Curry leaf	*Murraya koenigii*	seeds/ root suckers
4	Tapioca	*Manihot esculentus*	stem cutting

Q. 12 Match the pairs

Ans.

A	B
1 Basella	h) *Basella rubra*
2 Ridge gourd	c) Satputia
3 Aerial Yam	g) Konkan Kalika
4 Winged bean	b) *Psophocarpus tetragonolobus*
5 Drumstick	a) Konkan Ruchira
6 Cluster bean	d) Pusa Navbahar
7 Bacterial wilt resist variety of tomato	e) Sonali
8 Agathi	f) *Sesbania grandflora*