

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END THEORY EXAMINATION

B. Sc. (Agri.)

Semester : V (New)
Course No : HORT - 354

Academic year : ~~2018-19~~ 2019-20
Title : Production technology for ornamental crops, MAP and landscaping.
Total marks : 40
Time :

Credits : 2 (1 + 1)
Day & date :

SECTION 'A'

Q. 1 Write about cultivation of chrysanthemum in respect of following points. (4 marks)

1. Soil & Climate
2. Varieties
3. Pinching & disbudding
4. Harvesting & Yield

Ans. 1. **Soil & Climate** – Soil – Well drained, sandy loam soils having good texture and aeration. Having pH 6.5 to 7.0. High organic content is ideal for good crop. It is shallow rooted plant and is very sensitive to water logging. Light soils are not suitable due to less water holding capacity.

Climate – It is a short day plant. Long day during vegetative phase and short day during reproductive phase. Optimum temperature 16-25°C. Successfully cultivated up to altitude of 1200 m.

2 **Varieties** – Flowers are classified by kind and arrangement of florets (Disc and Ray). Single – One or more ray flowers. Anemone – Disk floret are elongated. Pompons – Globular head formed by uniform ray florets. Decorative – Large size ray florets. Large flowered – Blooms greater than 10 cm length.

3. **Pinching & disbudding** – Pinching – is also called as stopping. It is retardation of upward growth by removing soft veg. growth. It increases the number of flowering stems. Indirectly, it also control flowering date and bloom quality. Two types of pinching – 1. Soft pinching 2. Hard pinching.

Disbudding – It is performed for large and decorative flowers. In this, the largest terminal bud is reserved and all axillary buds are removed. Disbudding in spray varieties is very easy there large apical bud is removed and axillary buds are allowed to grow. Depending upon the no. of flowers to be harvested, no. of lateral branches is allowed to grow.

4. **Harvesting & Yield** – Harvesting – As per variety harvesting starts 3-4 months after

transplanting. For cut flowers stems are cut above 10 cm from soil. Lower 1/3rd portion should be deeped in water.

Yield – Flowering season varies. Most of areas from July to February. About 15 harvestings are done. Average yield – 10-25 tons/ ha loose flowers.

Q. 2 Write about cultivation of jasmine in respect of following points. (4 marks)

- | | |
|----------------------------|-----------------------|
| 1. Soil & Climate | 3. Pruning |
| 2. Propagation and Spacing | 4. Harvesting & Yield |

Ans. 1. **Soil & Climate** – Soil – Loamy garden soils are best with application of manures and assured irrigation. It can be grown in sandy soils also. Clay soils are not suitable for cultivation of jasmine.

Climate – It prefer mild tropical climate, mild winter, Warm summer, moderate rainfall and sunny days are ideal.

2. **Propagation & Spacing** - It is propagated by cuttings, budding or grafting. Cuttings and layerings are common. IBA @ 4000 ppm increases the rooting percentage.

Spacing – *J. sambac* – 1.2 x 1.2 m, *J. grandiflorum* – 1.5 x 1.5 OR 1.8 x 1.5 m, *J. auriculatum* – 1.8 x 1.8 m, *J. multiflorum* – 1.2 x 1.2 m.

3. **Pruning** - Pruning encourage growth of new shoots which gives flowers yield.

J. grandiflorum and *J. grandiflorum* are pruned in Dec and Jan which increases flower yield.

J. sambac should be pruned first in October and then in March- April.

Pruning should be done 90 cm above ground level.

4. **Harvesting & Yield** – Harvesting – Starts flowering 2nd year onwards. Economical yield obtained from 3rd year. It produces flowers till 12-15 years. Flowers are harvested in evening or morning. Fully developed buds before opening are harvested. For extraction of oil, fully opened flowers are harvesting.

Yield- Mogra - 40-50 q/ha, Jui - 60-80 q/ha

Q. 3 Write in details on commercial cultivation of gladiolus on following points (4 marks)

- | | |
|-----------------------------|----------------------------|
| 1. Soil & Climate | 3. Manures and fertilizers |
| 2. Propagation and planting | 4. Harvesting & grading |

Ans. 1. **Soil and climate**: Well drained fertile soil, pH 6 to 7, light textured soil with good organic manure.

2. **Propagation and planting**: By corms and cormels having 2 to 5 cm. diameter are

selected. Corms are treated with 0.2 per cent bavistin for 30 min. planting on flat beds at depth of 7 cm at 30 x 20 cm spacing, corms requirement 1.5 lakhs/ha.

3. **Manures and fertilizers:** FYM-25 tones/ha. At land preparation N. 80 to 150 kg, P 40 to 60 kg, K-100 to 200 kg, Mg 30 to 40 kg/ha., Split application at 3, 4 and 5 leaf stage.

5. **Harvesting and grading:** Cutting of spike at tight bud stage.

Grading	Grade	Spike length (cm)	No. of flowers (No.)
	Fancy	more than or equal 107	16
	Special	96 to 107	15
	Standard	81 to 96	12
	Utility	Less than 81	10

Q. 4 Write in brief on protected cultivation of rose on following. (4 marks)

1. Climate
2. Pinching
3. Times of Pruning
4. Harvesting & Yield

Ans. 1.Climate :

Temperature:- Temperature is an important factor regulating the growth of rose plant. It requires night temperature between 15 to 18°C and day temperature of 20 to 25°C.

Light:- A light duration lesser than 12 hrs leads to lower number of flowers and the flowers are of inferior quality too

Humidity:- Humidity plays an important role in the incidence of pests and diseases affecting the growth and flowering. High relative humidity causes fungal diseases like mildews..

2.Pinching

Apical portion of shoot if removed early a large number of auxiliary shoots arise resulting in well shaped bushy plants bearing more number of uniform flowers

3. Time of pruning

Exactly 45 days prior to the date of requirement of flowers during October-December. Pruning is necessary when the yield and quality declines.

1st Year: Cut back the shoots to four developed buds remain. Allow the lateral shoots.

2nd Year: Retain all strong shoots and remove weak and diseased shoots.cut back the strong shoots to 4-5 buds.

3rd Year: Cut back the vigorous shoots to half of its growth

After 5-6 years the plants are to be rejuvenated. Cut back all the main branches at 15-20 cm from the base. Apply Bordeaux paste over cut ends to prevent diseases.

4. Harvesting and yield:- Flowering starts from 1st year onwards. Economic yield 2nd to 10th year. Flowers are harvested when the flower buds are in half open stage. For cut flowers, they are harvested at tight bud stage with long stalks.

Yield- Loose flowers -7.5 t/ha

Cut flowers – 1st Year-100-200 flowers/m²

2nd Year- 200-240 flowers/m²

3rd Year-300.-360 flowers/m²

Q. 5 Comment on importance and scope of Medicinal and Aromatic plants in India.

(4 marks)

Ans. Medicinal plants –

(2 marks)

India is one of the few countries where almost all the known medicinal plants can be cultivated. Among the various plants in great demand in the country and abroad are Opium poppy, tropane alkaloid bearing plants, sapogenin bearing yams, senna, psyllium husk and seeds, cinchona and ipecac. In India 2,000 species of medicinal plants and a vast geographical area with high production potential and varied agro-climatic conditions. Cultivation of medicinal plants offers considerable scope for rural employment and export for foreign-ex-change earnings. India is already a major exporter of medicinal plants with estimate that rupees 86 crores worth of raw materials and drugs from medicinal plants are exported from India. It holds monopoly in the production and export of psyllium and senna and is second largest exporter of Opium latex.

Aromatic Plants -

(2 marks)

Aromatic plants contain essential oils-used in perfumes, scents, creams, soaps high demand extensively used at ceremonies, festivals, marriages etc. creat pleasant atmosphere have export value internal demands are high employment generation. Uncultivable marginal lands can be used intercrops or mixed crops in Agroforestry additional income stable and increasing market prices.

Q. 6 Write cultivation for Vetiver on the following aspects. (4 marks)

1) Climate and soil 2) Propagation 3) Manures & fertilizers 4) Harvesting

Ans. 1) Climate – Requires mild climate - grow in wet and dry tropical area. Soil – Loose sandy soils - sloppy lands - well drained soils are required.

2) Propagation – By tillers or slips – top portion is cutoff – fresh material is used.

3) Manures & fertilizers – 10 t F.Y.M, 22.5 kg P₂O₅ and 22.5 kg K₂O / ha is optimum dose. 20 kg N / ha given two months after planting.

4) Harvesting – 1 to 1½ year old plants are uprooted, roots are cleaned and dried.

Q. 7 Explain about cultivation of Periwinkle considering the following points.

1) Climate and Soil 2) Land preparation 3) Planting 4) Harvesting (4 marks)

- Ans.**
- 1) **Soil and climate** – Soil pH 7.0 - 8.5, well drained, marginal to fertile soils. Requires tropical to subtropical climate, Rainfall 100 cm or more – hardy crop.
 - 2) **Land preparation** – ploughing 2 - 3 times – harrowing - removal of stubbles - mix 8-15t. of FYM, 250 kg rock sulphate per ha - prepare ridges or flat beds.
 - 3) **Planting** – Seedlings are transplanted or direct sowing in June-July, seed rate 2-3 kg/ha - spacing 45 cm x 30 cm.
 - 4) **Harvesting** – Leaves are harvested twice in a year - first picking after 6 months and second after 9 months - After one year crop is dugout. Roots, stem and leaves are collected washed and dried under sun.

Q. 8 Write in brief cultivation of Citronella considering following points. (4 marks)

- 1) Propagation 2) Planting 3) Aftercares 4) Harvesting and Yield

Ans. Cultivation of citronella

- 1) **Propagation** – Rooted slips are used for planting.
- 2) **Planting** :-It is done in April – May, after regular monsoon starts, spacing is 90 cm x 60 cm. Two slips are planted per hill to 15 cm. depth.
- 3) **Aftercares** – Weeding, earthing up, soil working etc. are done. Basal dose 60 kg P and 50 kg K/ha. N 125 kg/ha. is N given in split doses after every harvesting.
- 4) **Harvesting** – First cutting of grass is done after 4-5 months and thereafter 2 months interval. Yield – 100-200 kg. oil / ha or 40-50 t. herbage / ha

Q. 9 Write uses of the following

- 1) Isabgol 2) Lemon Grass 3) Vetiver 4) Geranium (4 marks)

- Ans.**
- 1) **Isabgol** –It has the property of absorbing and retaining water (40-90%) and therefore it works as an antidiarrhoea drug. It is beneficial in chronic dysenteries of amoebic and bacterial origin. The seed has also cooling and demulcent effect and is used in ayurvedic, unani and allopathic medicines. The husk yields a colloidal mucilage consisting mainly of xylose, arabinose and galacturonic acid.
 - 2) **Lemon Grass** - a.Chief constituent of the oil is citral, which is used in the manufacture of vitamin A tablets. b. Oil has bactericidal, insect repellent, mosquito repellent and medicinal uses.c. Used in soap and detergent making.d.Spent grass is good cattle feed and used in making silage. e. Spent grass is used for preparing card boards, paper and fuel.
 - 3) **Vetiver** - The vetiver oil is extracted from the roots of grass. Oil from roots is used for soap making, perfumes and attars. Roots are used to make mats, brooms,screens, mattresses along with bamboo. Roots used in pharmaceuticals. Leaves are used as roofing material and for mulching.

- 4) **Geranium**- Oil possess strong rose like odour. Chief constituent are geraniol 68 to 75% and citronellol (23 – 40%). Geranium oil is widely used in expensive soaps, perfumes and for the production of Rhodnol etc. Demand of oil is 40 to 50 t per year. Internal production of oil is only 20 tonnes from about 1400 ha.

Q. 10 Define landscaping. Describe in brief about the principles of landscaping (4 marks)

Ans. **Landscaping** can be defined as decoration of fact of kind with plants and other garden material so as to produce a pictures and other naturalistic effect in a limited space.

Principles of Landscaping:-

1. Initial approach
2. Axis
3. Focal point
4. Mass effect
5. Unity
6. Space
7. Divisional lines
8. Proportional scale
9. Texture
10. Time and Light
11. Tone and Colour
12. Mobility

SECTION 'B'

Q. 11 Write plant part / parts used for propagation of the following (4 marks)

- 1) Gladiolus-Corms 2) Jasmine-Cuttings 3) Palmarosa-Seeds and rooted slips
- 4) Isabgol-Seeds

Q. 12 Match the pairs (4 marks)

- | | A |
|----|----------------------------|
| 4) | <i>Cymbopogon citrates</i> |
| 3) | <i>Catharanthus roseus</i> |
| 1) | <i>Polianthes tuberosa</i> |
| 2) | <i>Tagetes erecta</i> |

- | B |
|---------------------|
| 1) Lemon grass |
| 2) Periwinkle |
| 3) Tuberose |
| 4) African Marigold |