PRACTICAL MANUAL

Potato and Tuber Crops

(Course No. HVS 302) Credits: 2(1+1)

[For B. Sc. (Hons.) Horticulture 5th Semester Students]

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and

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College of Horticulture & Forestry

Rani Lakshmi Bai Central Agricultural University

Jhansi, Uttar Pradesh

Syllabus:

Identification and description of potato and tropical, sub-tropical and temperate tuber crops; planting systems and practices; field preparation and sowing/planting. Top dressing of fertilizers and inter-culture and use of herbicides and growth regulators; identification of nutrient deficiencies, physiological disorders; harvest indices and maturity standards, post-harvest handling and storage, marketing. Seed collection, working out cost of cultivation, project preparation of commercial cultivation.

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Exercise- 1

Objective: To study the identification of potato and tuber crops.

Sl. No.	Common Name	Scientific Name	Family	Edible part(s)	Description
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Differentiate between white yam, greater yam and lesser yam.

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Advantages of tuber crops

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Exercise- 2

Objective: To study the planting of potato and tuber crops.

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Ridge and Furrow Method:……..……..

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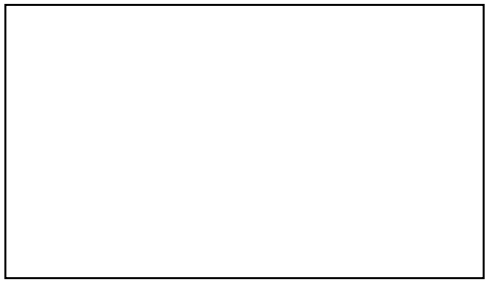

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Flat Bed Method:……..…….....……..……

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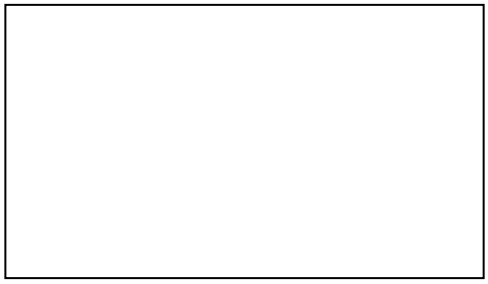

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Spacing: row to row and plant to plant (cm) under potato and tuber crops

Sl. No.	Name of the crop	Planting distance (row x plant) in cm
1		
2		
3		
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5		
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8		
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11		
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15		
16		

Importance of spacing of tuber crops

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Exercise- 3

Objective: To study the nutrient deficiencies and physiological disorder in potato.

Nitrogen Deficiency:……..……...……

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Phosphorus Deficiency:……..……...……

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Potassium Deficiency:……..……...……

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Sulfur Deficiency:……..……...……

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Magnesium Deficiency:……

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Manganese Deficiency:……

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Molybdenum Deficiency:……

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Zinc Deficiency:……

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Boron Deficiency:……

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Calcium Deficiency:……

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Copper Deficiency:……

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Iron Deficiency:……

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Write the physiological disorder of potato and its control

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Exercise: 4

Objective: To study the harvest indices and maturity standard of potato.

Harvest Index: ……..

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Physiological Maturity:……..

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Horticultural Maturity:…..……..……....

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Maturity Sign:……..……..……

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Lower Maturity:……..……..……

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Higher Maturity:……..……..……

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Harvesting:……..……..……

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Differentiate between physiological and horticultural maturity

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Maturity symptom of potato

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Exercise: 5

Objective: To study the postharvest handling of potato.

Postharvest Handling:……

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Harvesting:……

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Drying……..

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Curing……

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Sorting and Grading: …..……...

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Benefits: ……..……..

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Practices for grading of potatoes:……..……

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Exercise: 6

Objective: To study the postharvest handling of potato - packaging.

Packaging:……

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Materials Used for Packaging:……

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Transportation:……

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Storage:……..

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Intended Use	Temp (ºC)	RH (per cent)
Seed purpose		
Table purpose		
Processing purpose		

Benefits:……..

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Exercise: 7

Objective: To study the post-harvest handling of sweet potato.

Harvesting:……

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Harvesting method:

Manual Harvesting:……..……..……

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Mechanical Harvesting:……..……

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Exercise: 8

Objective: To study the curing of sweet potato.

Curing process:……

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Exercise: 9

Objective: To study the organic manure and bio-fertilizers.

Organic manure:……

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A) Bulky organic manures:……..

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B. Concentrated organic manures:

i) Manures of plant origin:

Sl. No.	Manure	Nutrient content (%)		
		N	P_2O_5	K_2O
1	Castor Cake			
2	Neem Cake			
3	Safflower cake			
4	Coconut			
5	Groundnut			
6	Niger			
7	Sesame cake			

ii) Manures of animal origin:

Sl. No.	Manure	Nutrient content (%)		
		N	P_2O_5	K_2O
1	Fish mean, fish manuring and fish guano			
2	Bone meal (Raw)			
3	Bone meal (Steamed)			
4	Settled sludge (Dry)			
5	Night soil			
6	Human urine			
7	Cattle dung and urine mixed			
8	Horse dung and urine mixed			
9	Sheep dung and urine mixed			

Methods of application of manures: ……

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Bio-fertilizers:……

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Importance of manures and fertilizers: ……

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Why leguminous plants are preferred for green manuring

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Exercise: 10

Objective: To study the inorganic fertilizer application in tuber crops.

Artificial fertilizers:……

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Nitrogenous fertilizer: ……

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Phosphorus fertilizers: ……

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Potassium fertilizers: ……

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Methods of application of fertilizers:……

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Recommneded dose of fertilizers (per hectare) in tuber crops:

Sl. No.	Name of Crop	Recommended dose FYM & N:P:K	Time of application
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Significance of inorganic fertilizers: ……

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Exercise: 11

Objective: To study the method of planting in potato and tuber crops.

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Recommneded spacing under potato and tuber crops

Sl. No.	Name of Crop	Spacing (Row X Plant) cm
1	Potato	
2	Sweet potato	
3	Cassava	
4	White yam	
5	Lesser yam	
6	Greater yam	
7	Elephant foot yam	
8	Taro	
9	Tannia	
10	Horse radish	
11	Jerusalem artichoke	
12	Arrow root	
13	Alocasia	
14	Yam bean	

Exercise: 12

Objective: Estimation of cost of cultivation and B: C ratio of Potato.

Cost of production of various inputs

A. Variable Cost: ……

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B. Fixed Costs: ……………………………………………………………………………………………..

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Sl. No.	Particulars	Quantity	Rate (Rs.)	Value (Rs.)	% to TC
A.	**Variable cost**				
1	Seed (q)				
2	FYM (q)				
3	Fertilizers				
i.	IFFCO mixer (Kg)				
ii.	Urea (Kg)				
4	Plant protection				
5	Tractor hours/Bullock charges				
6	Human labours (man days)				
i.	Field preparation				
ii.	Sowing				
iii.	Manuring				
iv.	Interculture				
v.	Irrigation				
vi.	Spraying				
vii.	Harvesting (Dehaulming, digging & filling in bags)				
7	Total human labour of which				
i.	Family labour				
ii.	Hired labour				
8	Sub total (1-7)				
9	Interest on working capital @8% p.a. (3 months)				
10	**Total variable cost (A=8+9)**				
B	**Fixed cost**				
i.	Rental value of land				
ii.	Interest on fixed capital @ 8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
C	**Total cost (A+B)**				
D	**Returns**				
	Yield (q)				
E	Gross returns				
F	**Net returns**				
	Benefit cost ratio (B:C ratio)				

Exercise: 13

Objective: Estimation of cost of cultivation and B: C ratio of sweet potato.

Sl. No.	Particulars	Quantity	Rate (Rs.)	Value (Rs.)	% to TC
A.	**Variable cost**				
1	Seed (no. of cuttings)				
2	FYM (q)				
3	Fertilizers				
i.	IFFCO mixer (Kg.)				
ii.	Urea (Kg)				
4	Plant protection				
5	Tractor hours/Bullock charges				
6	Human labours (man days)				
i.	Field preparation				
ii.	Sowing				
iii.	Manuring				
iv.	Interculture				
v.	Irrigation				
vi.	Spraying				
vii.	Harvesting (Dehaulming, digging & filling in bags)				
7	Total human labour of which				
i.	Family labour				
ii.	Hired labour				
8	Sub total (1-7)				
9	Interest on working capital @8% p.a. (3 months)				
10	**Total variable cost (A=8+9)**				
B	**Fixed cost**				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
C	**Total cost (A+B)**				
D	**Returns**				
	Yield (q)				
E	Gross returns				
F	**Net returns**				
	Benefit cost ratio (B:C ratio)				

Exercise: 14

Objective: Estimation of cost of cultivation and B: C ratio of elephant foot yam.

Sl. No.	Particulars	Quantity	Rate (Rs.)	Value (Rs.)	% to TC
A.	**Variable cost**				
1	Seed (q)				
2	FYM (q)				
3	Fertilizers				
i.	IFFCO mixer (Kg.)				
ii.	Urea (Kg)				
4	Plant protection				
5	Tractor hours/Bullock charges				
6	Human labours (man days)				
i.	Field preparation				
ii.	Sowing				
iii.	Manuring				
iv.	Interculture				
v.	Irrigation				
vi.	Spraying				
vii.	Harvesting (Dehaulming, digging & filling in bags)				
7	Total human labour of which				
i.	Family labour				
ii.	Hired labour				
8	Sub total (1-7)				
9	Interest on working capital @8% p.a. (3 months)				
10	**Total variable cost (A=8+9)**				
B	**Fixed cost**				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
C	**Total cost (A+B)**				
D	**Returns**				
	Yield (q)				
E	Gross returns				
F	**Net returns**				
	Benefit cost ratio (B:C ratio)				

Exercise: 15

Objective: Estimation of cost of cultivation and B: C ratio of cassava.

Sl. No.	Particulars	Quantity	Rate (Rs.)	Value (Rs.)	% to TC
A.	**Variable cost**				
1	Seed (no. of setts)				
2	FYM (q)				
3	Fertilizers				
i.	IFFCO mixer (Kg.)				
ii.	Urea (Kg)				
4	Plant protection				
5	Tractor hours/Bullock charges				
6	Human labours (man days)				
i.	Field preparation				
ii.	Sowing				
iii.	Manuring				
iv.	Interculture				
v.	Irrigation				
vi.	Spraying				
vii.	Harvesting (Dehaulming, digging & filling in bags)				
7	Total human labour of which				
i.	Family labour				
ii.	Hired labour				
8	Sub total (1-7)				
9	Interest on working capital @8% p.a. (3 months)				
10	**Total variable cost (A=8+9)**				
B	**Fixed cost**				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
C	**Total cost (A+B)**				

Exercise: 16

Objective: Estimation of cost of cultivation and B: C ratio of colocasia.

Sl. No.	Particulars	Quantity	Rate (Rs.)	Value (Rs.)	% to TC
A.	**Variable cost**				
1	Seed (q)				
2	FYM (q)				
3	Fertilizers				
i.	IFFCO mixer (Kg.)				
ii.	Urea (Kg)				
4	Plant protection				
5	Tractor hours/Bullock charges				
6	Human labours (man days)				
i.	Field preparation				
ii.	Sowing				
iii.	Manuring				
iv.	Interculture				
v.	Irrigation				
vi.	Spraying				
vii.	Harvesting (Dehaulming, digging & filling in bags)				
7	Total human labour of which				
i.	Family labour				
ii.	Hired labour				
8	Sub total (1-7)				
9	Interest on working capital @8% p.a. (3 months)				
10	**Total variable cost (A=8+9)**				
B	**Fixed cost**				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
C	**Total cost (A+B)**				
D	**Returns**				
	Yield (q)				
E	Gross returns				
F	**Net returns**				
	Benefit cost ratio (B:C ratio)				

Exercise: 17

Objective: Collection of potato and tuber crops sample and their description.

Exercise: 18

Objective: Project preparation of commercial cultivation of potato and tuber crops:

Notes