#### 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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College of Horticulture & Forestry
Rani Lakshmi Bai Central Agricultural University
Jhansi, Uttar Pradesh

#### Syllabus:

Date:

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 interculture 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.

Name of Student
Roll No.
Batch
Session
Semester
Course Name :
Course No. :
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in the yearin the respective lab/field of College.

Course Teacher

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17	Collection of potato and tuber crops sample and their description			
18	Project preparation of commercial cultivation of potato and tuber crops			

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

SI. 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					
<u> </u>					

Differentiate between white yam,	

Advantages of tuber crops

#### Exercise- 2

Objective: To study the planting of potato and tul	per crops.
Ridge and Furrow Method:	
Flat Bed Method:	

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

SI. No.	Name of the crop	Planting distance (row x plant) in cm
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Importance of spacing of tuber crops

#### Exercise- 3

Objective: To study the nutrient deficiencies and physiological disorder in potato.
Nitrogen Deficiency:
Phosphorus Deficiency:
Potassium Deficiency:
Cultur Deficiency:
Sulfur Deficiency:

Magnesium Deficiency:	 	
Manganese Deficiency:	 	
Manganese Deficiency:	 	
Manganese Deficiency:	 	
Manganese Deficiency:		
Manganese Deficiency:  Molybdenum Deficiency:		

Zinc Deficiency:.		 	 	
•				
		 	 •	
Boron Deficiency				
Boron Deliciency	·	 	 •••••	
Calcium Deficien	cy:	 	 	
Copper Deficience	χ:	 	 	
	•			

Iron Deficiency:	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	
Write the physiological disorder of potato and its control	

Objective: To study the harvest indices and maturity standard of potato.	
Harvest Index:	
Physiological Maturity:	••
	• • •
Horticultural Maturity:	•••
	• • •
Maturity Sign:	
maturity Olymenter Committee Committ	••
	• • •
	• • •
Lower Maturity:	
-	
Higher Maturity	

Harvesting:					 
Differentiate l	between physiolo	gical and horti	cultural maturi	ty	
B# 4					 
Maturity sym	ptom of potato				

Objective: To study the postharvest handling of potato.	
Postharvest Handling:	
_	
	••
Harvesting:	
	••
	••
	• • •
Drying	
	••
	• • •
Curing	• •
Sorting and Grading:	

• •

Objective: To study the postharvest handling of potato - packaging.	
Packaging:	
Materials Used for Packaging:	
Transportation:	

torage:		
torage		
	•••••	
Intended Hea	Tomp (0C)	PU (nor cont
Intended Use	Temp (°C)	RH (per cent
Intended Use Seed purpose Table purpose	Temp (°C)	RH (per cent
Table purpose	Temp (°C)	RH (per cent
Table purpose Processing purpose		RH (per cent
Table purpose		RH (per cent
Table purpose Processing purpose		RH (per cent
Table purpose Processing purpose		RH (per cent
Table purpose Processing purpose		RH (per cent
Table purpose Processing purpose		RH (per cent
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Table purpose Processing purpose		RH (per cent
Table purpose Processing purpose		RH (per cent
Table purpose Processing purpose		RH (per cent

Objective: To study the post-harvest handling of sweet potato.  Harvesting:
Harvesting method:
Manual Harvesting:
Mh
Mechanical Harvesting:

Grading:

Objective: To study the curing of sweet potato.
Curing process:
Storage:

Objec	ctive: To study th	e organic manure	and bio-fertilizers.	
Organ	ic manure:			
<b>.</b>				
	_			
A) Bul	ky organic manures	) <b>.</b>		
•••••				
•••••				
D Cor	ntrated argania r	Maninaai		
	ncentrated organic rures of plant origin:	nanures.		
SI.			Nutrient content (%)	
No.	Manure	N	P <sub>2</sub> O <sub>5</sub>	K₂O
1	Castor Cake			
2	Neem Cake			
3	Safflower cake			
5	Coconut Groundnut			
6	Niger			
•	INIGO			

Sesame cake

ii) Manures of animal origin:

Manure

SI.

No.

No.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
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			
Metho	ds of application of manures:			
Die fe	utili=ava.			
вю-те	rtilizers:			

Nutrient content (%)
P<sub>2</sub>O<sub>5</sub>

K<sub>2</sub>O

N

Importance of manures and fertilizers:	
importance of manares and fortingers.	
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
Why leguminous plants are preferred for green ma	anuring
	anuring

Objective: To study the inorganic fertilizer application in tuber crops.
Artificial fertilizers:
Nitrogenous fertilizer:
Phosphorus fertilizers:
Potassium fertilizers:
Mathada of application of foutilizans.
Methods of application of fertilizers:

Recommneded dose of fertilizers (per hectare) in tuber crops:					
SI. 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					
ignific	cance of inorganic fe	ertilizers:			

 Recom	ımneded spacing unde	er potato and tuber crops
		er potato and tuber crops
 SI.	nmneded spacing unde	Spacing
SI. No.	Name of Crop	
<b>SI. No.</b> 1	Name of Crop Potato	Spacing
\$I. No. 1	Name of Crop  Potato  Sweet potato	Spacing
<b>SI. No.</b> 1	Potato Sweet potato Cassava	Spacing
\$I. No. 1 2 3	Potato Sweet potato Cassava White yam	Spacing
SI. No. 1 2 3 4	Potato Sweet potato Cassava	Spacing
\$I. No. 1 2 3 4 5 6	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam	Spacing
\$I. No. 1 2 3 4 5 6 7	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro	Spacing
\$I. No. 1 2 3 4 5 6 7 8	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro Tannia	Spacing
\$I. No. 1 2 3 4 5 6 7 8 9	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro Tannia Horse radish	Spacing
\$I. No. 1 2 3 4 5 6 7 8 9 10	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro Tannia Horse radish Jerusalem artichoke	Spacing
\$I. No. 1 2 3 4 5 6 7 8 9 10 11	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro Tannia Horse radish Jerusalem artichoke Arrow root	Spacing
\$I. No. 1 2 3 4 5 6 7 8 9 10	Potato Sweet potato Cassava White yam Lesser yam Greater yam Elephant foot yam Taro Tannia Horse radish Jerusalem artichoke	Spacing

Objective: Estimation of cost of cultivation and B: C ratio of Potato.
Cost of production of various inputs
A. Variable Cost:

B. Fixed Costs:

SI. 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				
٧.	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)				
В	Fixed cost				
i.	Rental value of land				
ii.	Interest on fixed capital @ 8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
С	Total cost (A+B)				
D	Returns				
	Yield (q)				
Е	Gross returns				
F	Net returns				
	Benefit cost ratio (B:C ratio)				

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

SI. 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				
٧.	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)				
В	Fixed cost				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
С	Total cost (A+B)				
D	Returns				
	Yield (q)				
Е	Gross returns				
F	Net returns				
	Benefit cost ratio (B:C ratio)				

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

SI. 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				
٧.	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)				
В	Fixed cost				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
С	Total cost (A+B)				
D	Returns				
	Yield (q)				
Е	Gross returns				
F	Net returns				
	Benefit cost ratio (B:C ratio)				

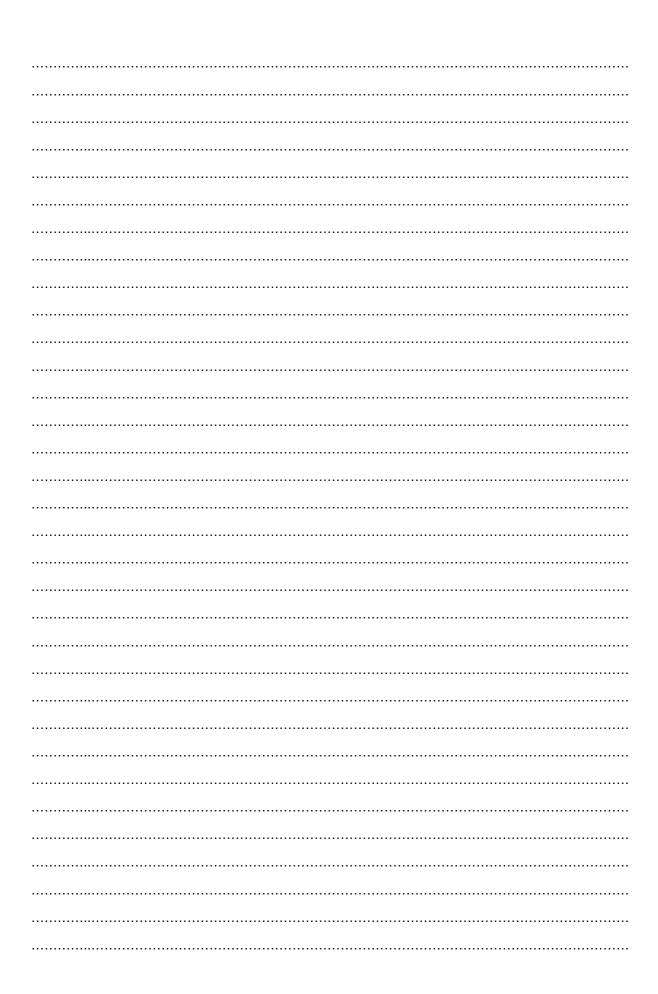
# Objective: Estimation of cost of cultivation and B: C ratio of cassava.

SI. 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				
٧.	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)				
В	Fixed cost				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
С	Total cost (A+B)				

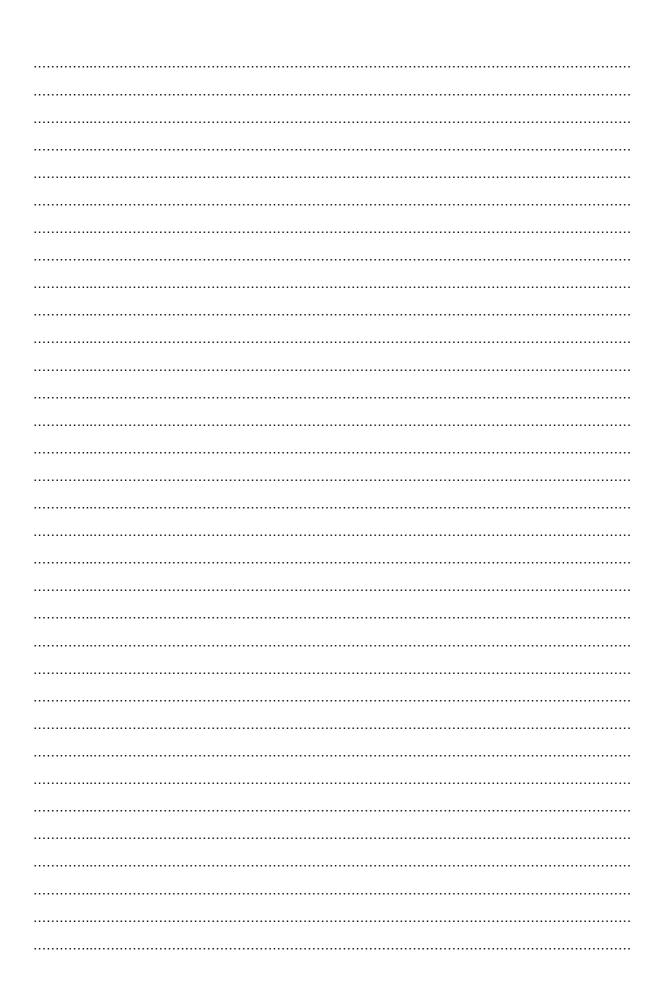
# Objective: Estimation of cost of cultivation and B: C ratio of colocasia.

SI. 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				
٧.	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)				
В	Fixed cost				
i.	Rental value of land				
ii.	Interest on fixed capital @8% p.a. (3 months)				
iii.	Depreciation				
	Total fixed cost				
С	Total cost (A+B)				
D	Returns				
	Yield (q)				
Е	Gross returns				
F	Net returns				
	Benefit cost ratio (B:C ratio)				

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
