

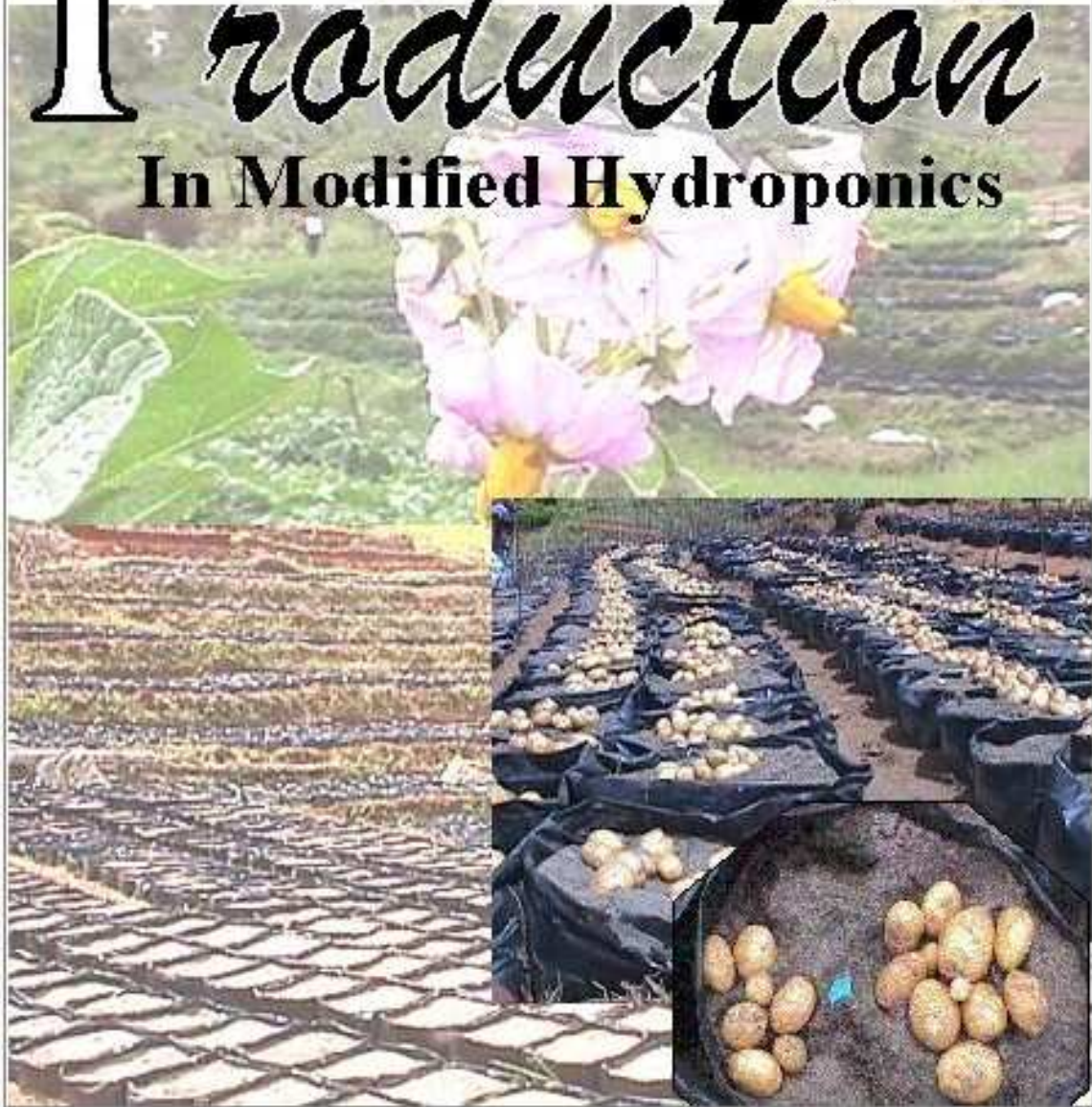


Department of Agriculture
Southern Mindanao Integrated Agricultural Research Center
Davao City, Region XI

Potato

Production

In Modified Hydroponics



Introduction



Potato (*Solanum tuberosum* L.), granola as ware potato and atlantic as processing type cultivars gives a very high income potential and nutritional quality. It is popularly grown as an annual crop in some provinces of Northern Luzon and even in the Mindanao regions.

Potatoes tolerate a variety of soils, but the best soil is deep, well-drained soil/aggregates with good water-holding capacity, an optimum pH between 5.5—6.0, an elevation of at least 1,000 masl and average temperature of 18-22°C. It matures in 90-100 days from planting and has a commercial yield of 25-35 tons per hectare.

These are grown in an inert medium (sand and coco coir dust) that was developed as a more practical modified hydroponics system. And by raising plants in a sterile medium in which there are no reserve nutrients, it can be sure that every plant gets the precise amount of nutrients and water it needs. There are several reasons why this method or technique is used. First, no soil is needed; large plant population could be grown in a very small area. Excellent reason for replacing soil with a sterile medium is that soil-borne pests and diseases are immediately eliminated. Thus, risk on detrimental disease like bacterial wilt could be avoided. Second, when managed properly, optimum production could be attained and as a rule, the quality is better and had much longer shelf life than that grown in the soil. Labor involved in tending the plants is markedly reduced. (<http://archimedes.galilei.com/raiar/histhydr.html>). Since in one cycle only 30 man days is needed.

Materials :

- 10 bags fertilizer (12-11-18)
- 1 liter Insecticides
- 1.5 kg Fungicides
- 85 kg Seed tubers
- 1,000 pcs. Polyethylene bag (24x24x.006)
- 20 cu.m. coarse river sand
- 150 bags Coir dust
- 5 gallons Disinfectant

Cultural Management Practices

1. Secure quality seed tubers:
2. Prepare/Clear a 200 sq.m. area
3. Prepare a medium/substrate with a ratio of 1:2 coco coir dust and coarse sand. Place the mixture 5" depth in a 24x24x.006 polyethylene bag
4. Three days before planting, disinfect the medium with 0.5% Sodium Hypochlorite solution (Dilute 5 liters in 100 liters water) by drenching 1 liter solution per bag
5. Plant the seed tubers with a seedling rate of 2-4 tubers /bag
6. Dilute 2 kg 12-11-18 in 200 lit. water with anti-bacterial solution and drench 1 liter solution each bag one (1) week after planting, then on the 3rd week and weekly thereafter up to the 10th week.
7. Then apply granular fertilizer at a rate of 10 grams per bag two weeks after planting
8. Spray insecticide within a week after planting to control cutworms/aphids. Succeeding sprays may depend on infestation level, use IPM as much as possible.
9. Early spraying of fungicides to protect the plant from early and late blight infestation. Use protectant fungicides as much as possible. In case of severe infections of early and late blight, use systemic-curative fungicides.
10. Hill-up on the 2nd, 4th, 6th, 8th and 10th week after planting by adding sufficient volume of medium which have been disinfected with sodium hypochlorite to ensure tuber dev't and avoid "greening". The depth of medium is expected to reach 8 inches to 10 inches from about 5 inches during planting.
11. Dehaulming will be done by cutting all foliage & stem when leaves start turning yellow (senescence) and wait for 14 days before harvesting the tubers.
12. Harvest potato by hand digging each bag and collect using plastic crates as best Container for handling/transport and storage.
13. Sort or classify as ware potatoes for commercial market.



Potato Production in Modified Hydroponics

Module area : 200sq.m.

1 module = 1,000 bags (24x24x.006)

Quantity	Particulars	Price/Unit	Total
1,000 pcs	Polyethylene Bags	12.00	12,000.00
20 cu.m.	Coarse river sand	40.00	8,000.00
150 bags	Coir dust	40.00	6,000.00
1 liter	Insecticide		500.00
1.5 kg.	Fungicides		180.00
100 kgs / 10 bags	Fertilizers (12-11-18)	300	3000.00
85 kg.	Seed tubers	50.00	4250.00
5 gallon	Disinfectant	75.00	375.00
Others: Contingency, interest & etc.			7000.00
Labor	Clearing/Terracing if needed, Fertilizer/Pesticide Application, Maintenance		5,800.00
TOTAL			P 47,105.00

Sensitivity Analysis on Estimated Costs and Return (3 Cycles [90 days/cycle])

		1st cycle	2nd cycle	3rd cycle	Total	Projected Net Income
COST		47,105	11,305	11,305	69,715	
YIELD						
	0.80 kg/ bag	800 kgs	800 kgs	800 kgs	2,400 kgs	
	1.0 kg/bag	1,000 kgs	1,000 kgs	1,000 kgs	3,000 kgs	
	1.5 kg/ bag	1,500 kgs	1,500 kgs	1,500 kgs	4,500 kgs	
G R O S S S A L E S						
Price	P20/kg					
		16,000	16,000	16,000	48,000	-21,715
		20,000	20,000	20,000	60,000	-9,715
		30,000	30,000	30,000	90,000	20,285
	30/kg					
		24,000	24,000	24,000	72,000	2,285
		30,000	30,000	30,000	90,000	20,285
		45,000	45,000	45,000	135,000	65,285
	40/kg					
		32,000	32,000	32,000	96,000	26,285
		40,000	40,000	40,000	120,000	50,285
		60,000	60,000	60,000	180,000	110,285

Cost and Return Analysis (actual for 1 cycle)

1 Module : 1000 bags

Area: 200 sq.m

Materials/ Inputs	1st cycle	2nd cycle	3rd cycle	Total
1000 pcs P.E. bags (24x24x.0006)	12,000	-	-	
20 cu.m. coarse river sand	8,000	-	-	
150 bags coco coir dust	6,000	-	-	
1 lit insecticide	500	500	500	
1.5 kg. fungicide	180	180	180	
10 bags fertilizers @ P300	3000	3000	3000	
85 kg. Seed tubers @ P50	4,250	4,250	4,250	
5 gal. Disinfectant @ P75	375	375	375	
2 units plastic drum @ P800	1,600	-	-	
1 unit knapsack sprayer	1,800	-	-	
3 pcs. selector knife @ P50	150	-	-	
Sub-total	37,855	8,305	8,305	54,465
LABOR:				
Cleaning / terracing	1000	-	-	
Hauling & Mixing of Medium	3,000	-	-	
Off-Loading of Medium	-	1,000	1,000	
Bagging @ P1.00/bag	1,000	1,000	1,000	
Hilling up, fertilizer & pesticide Application (6MD)	600	600	600	
Harvesting / Hauling (2MD)	200	200	200	
Sub-total	5,800	2,800	2,800	11,400
TOTAL COST	43,655	11,105	11,105	65,865
YIELD (KG)	810	810	810	
PRICE	P35.00			
GROSS INCOME	28,350	28,350	28,350	85,050
NET INCOME	(15,305)	17,245	17,245	19,185
R O I				29.13%

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Knowledge Management / FITS Center

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