

Economic analysis of the New Vacuum and Steam Phytosanitation Technology

Henry Quesada

Department of Sustainable Biomaterials

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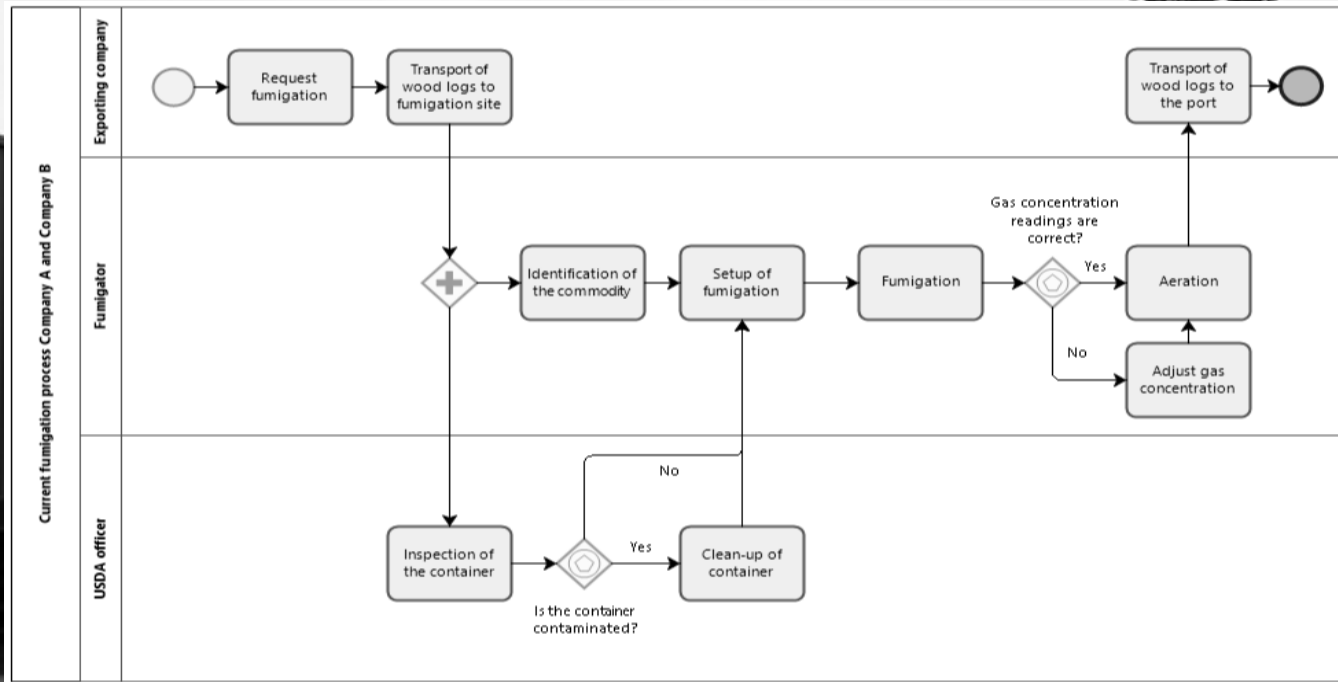
Agenda

- Current process
- Cash flow analysis for current process
- Proposed process
- Cash flow analysis for proposed process
- Cash flow risk analysis for proposed process
- Questions

Current Process

- Methyl Bromide

Treatment time





Current
Fumigation
Price

Price of oak and non oak logs
Descriptive Statistics: Price (per container)

Statistics

Variable	Classification	Total			
		Count	Mean	StDev	Median
Price (per container)	-	91	714	301	900
	All other logs	58	518.4	182.6	550.0
	Oak	54	859.4	220.6	950.0

Price of oak logs species

Price of non-oak logs species

Results for Classification = Oak

Statistics

Variable	Species	Total			
		Count	Mean	StDev	Median
Price (per container)	Oak	40	855.3	249.0	950.0
	Red oak	10	925.0	79.1	950.0
	White oak	4	737.5	25.0	750.0

Results for Classification = All other logs

Statistics

Variable	Species	Total			
		Count	Mean	StDev	Median
Price (per container)	Ash	2	200.00	0.000000	200.00
	Elm	2	550.00	0.000000	550.00
	Most logs	3	500.00	0.000000	500.00
	Non-oak	29	600.5	175.7	575.0
	Pine	7	290.0	79.8	300.0
	Softwood	10	560.0	31.6	550.0
	Walnut	4	375	202	375
	Yellow pine	1	525.00	*	525.00

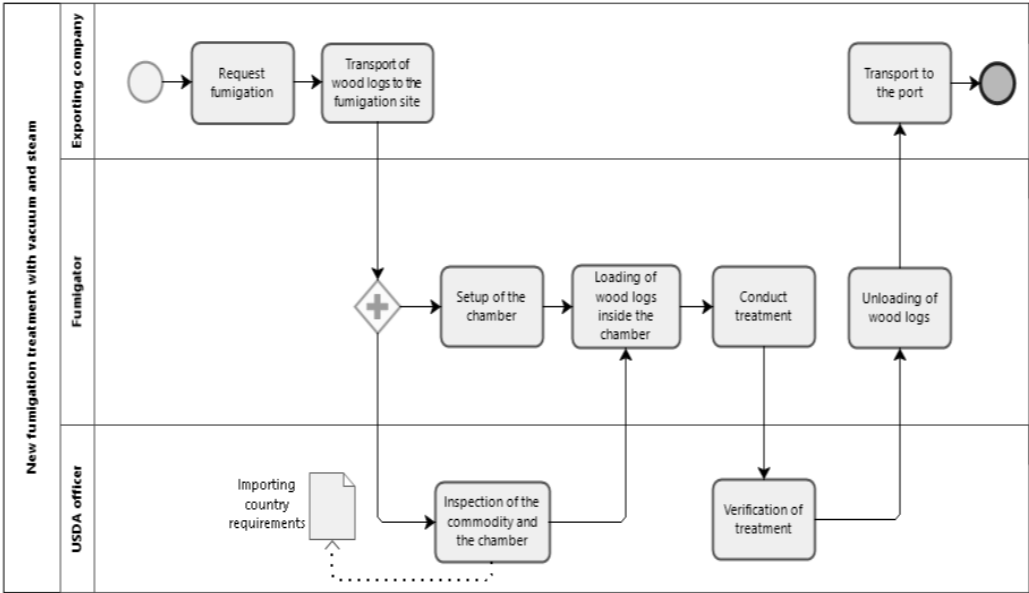
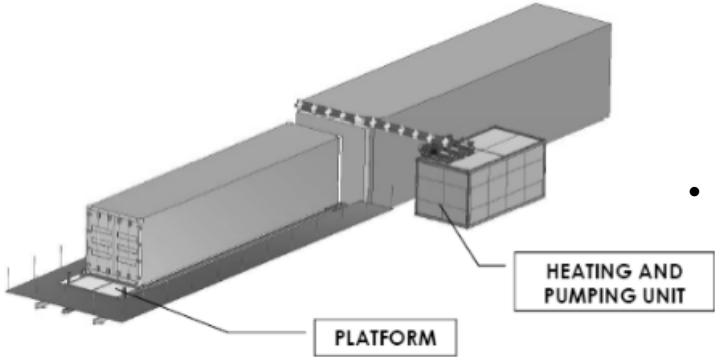
	Year	
	Annual cash flows	
Sales		
Oak logs fumigation	\$	103,128.00
Non-oak logs fumigation	\$	559,872.00
Cost		
Methyl bromide for oak	\$	29,520.00
Methyl bromide for non-oak	\$	90,720.00
Fumigator salary	\$	31,285.73
Supervisor salary	\$	21,900.01
Gross margin	\$	489,574.26
Depreciation		
Fans	\$	20.00
Gas sampling tubes (leads)	\$	6.00
Volatilizer	\$	40.00
Warning signs/Placarding	\$	12.00
Gas introduction lines	\$	6.00
Administrative Expenses		
Administrative salary	\$	36,500.00
Marketing	\$	39,165.94
Utilities	\$	43,980.00
Training	\$	5,008.00
Profit before tax	\$	364,836.32
Taxes	\$	18,241.82
Profit after tax	\$	346,594.51
Fans	\$	20.00
Gas sampling tubes (leads)	\$	6.00
Volatilizer	\$	40.00
Warning signs/Placarding	\$	12.00
Gas introduction lines	\$	6.00
Initial investment	\$	24,086.00
Net flow	\$	(24,086.00) \$ 346,678.51



- Volume of fumigation per month: 100 containers
- Volume of oak logs per month: 10 containers
- Volume of non-oak logs per month: 90 containers
- Volumen of fumigation per year: 1200 containers
- Price of fumigation of oak logs: \$859.40
- Price of fumigation of non-oak logs: \$518.40

Proposed process

- Vacuum-Steam



Proposed technology: Initial investment

- Total initial investment: \$777,460
 - Chamber: \$657,400
 - 30 BHP gasfired boiler: \$40,000
 - Permits, installation, piping and electrical wiring: \$80,000
- Annual capacity: 424 containers
 - 18 hour cycle time, 30 mins for loading and unloading
 - 24 hours, 7 days a week, 50 weeks per year
- Revenue per year: \$234,393.9 (\$552.5 per container)

Proposed process: cash flow from operations

- 20% down at 5% interest rate
- Operating cash flow for 1 and 2 units

1 unit		
Annual Income statement		
Sales		
Vacuum treatment	\$	234,393.94
Cost		
Electricity consumption	\$	370.97
Water consumption	\$	357.72
Natural gas consumption	\$	12,392.12
Fumigator salary	\$	5,303.03
Gross margin	\$	215,970.09
Depreciation		
Chamber	\$	65,746.00
30 BHP gas fired boiler	\$	4,000.00
Administrative Expenses		
Administrative salary	\$	50,000.00
Marketing	\$	8,638.80
Utilities, building rental	\$	43,980.00
Training	\$	5,008.00
Earnings before interest and taxes	\$	38,597.29
Interest	\$	31,098.40
Taxes	\$	1,929.86
Earnings after taxes and interest	\$	5,569.02

2 units		
Annual Income statement		
Sales		
Vacuum treatment	\$	468,787.88
Cost		
Electricity consumption	\$	2,375.76
Water consumption	\$	2,290.91
Natural gas consumption	\$	24,784.24
Fumigator salary	\$	10,606.06
Gross margin	\$	428,730.91
Depreciation		
Chamber	\$	131,492.00
30 BHP gas fired boiler	\$	8,000.00
Administrative Expenses		
Administrative salary	\$	50,000.00
Marketing	\$	17,149.24
Utilities, building rental	\$	43,980.00
Training	\$	5,008.00
Earnings before interest and taxes	\$	173,101.67
Interest	\$	62,196.80
Taxes	\$	8,655.08
Earnings after taxes and interest	\$	102,249.79

Proposed process: total cash flow

- Use Net Present Value (NPV) for cash flow analysis
- One unit

Interest		5%			
		NPV			
Year	Cash flow operation (EBIT plus depreciation)	Cash flow financing		Total cash flow	Present value
		(Payments to the principal)	Cash flow investing		
0	\$ -		\$ (155,492.00)	\$ (155,492.00)	\$ (155,492.00)
1	\$ 75,048.74	\$ (45,613.70)		\$ 29,435.04	\$ 28,033.37
2	\$ 77,329.42	\$ (47,894.38)		\$ 29,435.04	\$ 26,698.45
3	\$ 79,724.14	\$ (50,289.10)		\$ 29,435.04	\$ 25,427.09
4	\$ 82,238.60	\$ (52,803.56)		\$ 29,435.04	\$ 24,216.28
5	\$ 84,878.77	\$ (55,443.73)		\$ 29,435.04	\$ 23,063.12
6	\$ 87,650.96	\$ (58,215.92)		\$ 29,435.04	\$ 21,964.88
7	\$ 90,561.76	\$ (61,126.72)		\$ 29,435.04	\$ 20,918.93
8	\$ 93,618.09	\$ (64,183.05)		\$ 29,435.04	\$ 19,922.79
9	\$ 96,827.24	\$ (67,392.20)		\$ 29,435.04	\$ 18,974.09
10	\$ 100,196.85	\$ (70,761.81)		\$ 29,435.04	\$ 18,070.56
NPV	\$ 661,705.73	\$ (573,724.17)	\$ (155,492.00)		\$ 71,797.57

IRR	8.3%	Net profit margin	2.3%
ROA	0.7%		

Proposed process: total cash flow

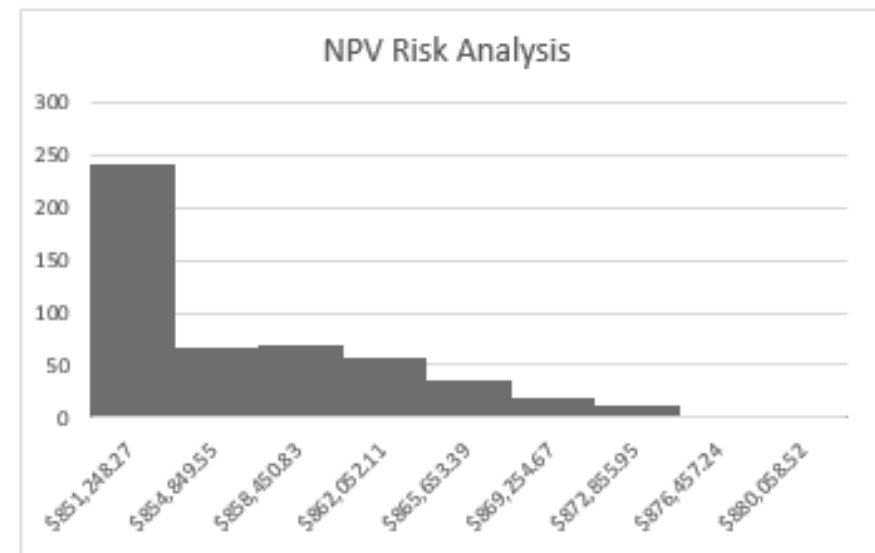
- Use Net Present Value (NPV) for cash flow analysis
- Two units

Interest		5%				
NPV						
Year	Cash flow operation (EBIT plus depreciation)	Cash flow financing (Payments to the principal)		Cash flow investing	Total cash flow	Present value
		0	\$ -			
1	\$ 244,026.89	\$ (91,227.39)			\$ 152,799.49	\$ 145,523.33
2	\$ 248,588.26	\$ (95,788.76)			\$ 152,799.49	\$ 138,593.64
3	\$ 253,377.69	\$ (100,578.20)			\$ 152,799.49	\$ 131,993.95
4	\$ 258,406.60	\$ (105,607.11)			\$ 152,799.49	\$ 125,708.52
5	\$ 263,686.96	\$ (110,887.47)			\$ 152,799.49	\$ 119,722.40
6	\$ 269,231.33	\$ (116,431.84)			\$ 152,799.49	\$ 114,021.33
7	\$ 275,052.93	\$ (122,253.43)			\$ 152,799.49	\$ 108,591.75
8	\$ 281,165.60	\$ (128,366.10)			\$ 152,799.49	\$ 103,420.71
9	\$ 287,583.90	\$ (134,784.41)			\$ 152,799.49	\$ 98,495.92
10	\$ 294,323.12	\$ (141,523.63)			\$ 152,799.49	\$ 93,805.63
NPV	\$ 2,048,709.50	\$ (1,147,448.35)		\$ (310,984.00)		\$ 868,893.19

IRR	41.1%	Net profit margin	22.3%
ROA	3.4%		

Net Present Value (NVP) Risk analysis

- Consider demand normal
 - Mean=848 and stdv=84.8 containers
- 99.7% confidence interval
 - Mean+3*stdv
- Two units
- Simulated 500 possible scenarios for demand



Thank you!

Henry Quesada
quesada@vt.edu