Understanding Financial Feasibility

Dr. Ryan Larsen

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How do we make decisions?

- What is the key information?
  - Business Plan
- What is the criteria we will use?
  - NPV
  - Partial Budget
- How will that fit into our system?

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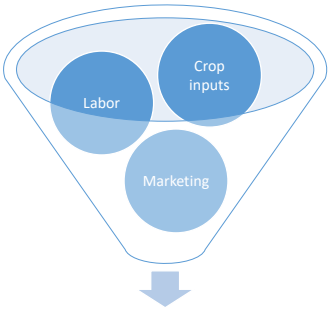
Production Systems



- What does it mean to think in systems?
- What does an agricultural production system look like?

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Business Plan

- A business plan is a road map for a business.
- It describes the key functions of the business – operations, finance, management, and marketing.
- It should support the mission statement, objectives and goals set by the owners.
- A business plan is a useful guide to the future of the business and a tool for acquiring capital from banks or investors.
- The business plan should be tailored to the preferences and concerns of those who will use it.
- The content of a business plan depends on factors such as the type of business and the way the plan will be used.

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Purpose of Business Plan

- To help the business management team make decisions to meet the specified objectives and goals.
- To help sell the feasibility of the business to bankers and other potential investors when requesting needed capital.

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Components of a Business Plan

- Business Description
  - History and location
  - Products and services
  - Organizational structure
  - Resource inventory
    - Human
    - Land
    - Equipment
    - Capital
    - Commodities
    - Natural Resources
  - Strengths, weaknesses, opportunities and threats (SWOT)
- Mission Statement
- Objectives and Goals
- Production Plan
- Financial Plan
- Market Plan
- Legal and Liability Issues
  - Insurance
  - Succession and estate planning

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Business Description and Organization

- It describes the history and location of the business, the products produced and/or services provided, the organizational structure, and resources the business has and needs.
- It also summarizes the business's strengths, weaknesses and opportunities, and threats the business may face.
- Organizational structure explains: 1) whether the business is a sole proprietorship, limited or general partnership, corporation, or other form of organization; and 2) who comprises the management team.

Mission Statement, Objectives and Goals

- A mission statement is a broad expression of the business's purpose.
- A business plan must define why the business exists and where the management wants it to be in the future.
- An effective mission statement is the foundation for determining objectives and goals and steering the business in the proper direction.
- The objectives and goals can relate to production, production costs, debt ratios, risk management, expansion, bringing a partner into the business, or any other aspect of the business.
- Objectives define what the operation will look like in the future, while goals are targets to be met in order to achieve the objectives and ultimately fulfill the mission statement.

Production Plan

- The production plan conveys the type and quantity of commodities to be produced, projected for 3 years into the future.
- The production plan should be easy for the reader to follow.
- Crop production plans should include the estimated acreage for each crop each year, and an estimated yield for each crop.
- Livestock production plans will include more variables, such as size of the herd, cull rates, weaning rates, weaning weights, rates of gain, purchase prices, sales prices, etc.
- The production plan should be defined for a minimum of 3 years.

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Financial Plan

- The primary purpose of the financial plan is to show whether or not the business is feasible.
- The financial plan typically includes 3 years of projected financial statements, including the income statement, the cash flow statement and the balance sheet. This information should be tied closely to the production plan figures.
- The financial plan should include: 1) the amount of money to be borrowed and the timing of loans; 2) the specific ways borrowed money will be used; 3) the length of the loan(s) and the interest rates; 4) the financial risks associated with the business; and 5) the strategies you will use to minimize these risks.

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What is Profit?

$$Profit = Gross\ Revenue\ - Total\ Costs$$

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What is Profit?

$$Profit = Gross\ Revenue - Total\ Costs$$

$$Gross\ Revenue = Price\ per\ Unit\ x\ Total\ Units$$

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What is Profit?

$$Profit = Gross\ Revenue - Total\ Costs$$

$$Total\ Costs = Variable\ Costs + Fixed\ Costs$$

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Defining Costs

$$Total\ Costs = Variable\ Costs + Fixed\ Costs$$

Variable Costs: expenses that vary without output within a production period and result from the use of purchased inputs and owned assets

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Variable Costs

- Key Variable Costs
  - Feed
  - Land rent
  - Breeding fees
  - Vet fees
  - Hired labor
  - Insurance
  - Minerals
  - Marketing costs
  - Operating interest
  - Fuel, oil, and repairs

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Defining Costs

$$Total\ Costs = Variable\ Costs + Fixed\ Costs$$

Fixed Costs: expenses that do not vary with output and result from ownership of assets.

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Fixed Costs

- Depreciation
- Taxes
- Interest on investment
- Land
- Insurance
- Management fee

Example

		Units	Quantity	Price	Total
Revenues					
	Early Out-of Season Strawberries	1 lb clamshells	373	$6.00	$2,238.70
	In-Season Strawberries	1 lb clamshells	472	$4.50	$2,122.61
Total Revenues					**$4,361.31**
Operating Expenses					
Supplies					
	Preplant and preparation costs				
	Soil test	Each	1	$14.00	$14.00
	Fuel	Gallons	0.38	$3.50	$1.31
	Preplant fertilizers and soil amendments	Pounds	2.25	$15.00	$33.75
	Plastic mulch	Foot	281	$0.05	$14.06
	Drip tape	Foot	576	$0.05	$28.80
	Strawberry establishment and growth				
	Plug plants	Each	743	$0.26	$193.05
	20-20-20 water soluable fertilizer mix	Pounds	11.34	$1.23	$13.95
	10-30-20 water soluable fertilizer mix	Pounds	2.84	$1.49	$4.22
	Captan	Pounds	0.43	$9.82	$4.20
	Thionex 50 W	Pounds	0.03	$7.51	$0.20
	Strawberry harvest				
	1 lb clamshells	Each	1033	$0.25	$258.19
Labor					
	Preplant and preperation costs				
	Soil test	Hours	0.5	$10.00	$5.00
	Apply preplant fertilizers	Hours	0.75	$10.00	$7.50
	Tillage	Hours	7.5	$10.00	$75.00
	Form raised beds	Hours	13	$10.00	$130.00
	Install drip tape	Hours	0.75	$10.00	$7.50
	Cover with plastic mulch	Hours	1	$10.00	$10.00
	Strawberry establishment and growth				
	Planting labor	Hours	6	$10.00	$60.00
	Fertigation	Hours	2	$10.00	$20.00
	Pesticide applications	Hours	4.5	$10.00	$45.00
	Hand weeding	Hours	4	$10.00	$40.00
	Plastic and shade cloth install/removal	Hours	12	$10.00	$120.00
	Monitoring and ventilation	Hours	30	$10.00	$300.00
	Strawberry harvest				
	Hand harvest	Hours	68	$10.00	$680.00
	Post-harvest				
	House clean out	Hours	4.5	$10.00	$45.00
Total Operating Expenses					**$2,110.73**
Fixed Expenses (Depreciation)					
	High Tunnel Annual				$248.17
	Irrigation System Annual				$58.82
Total Fixed Expenses					**$306.98**
Total Expenses					**$2,417.71**
Net Income					**$1,944.27**

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Break-Even Analysis

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Break-Even Analysis

- Utilize cash expenses to determine cash break-even costs
- Can calculate yields required to cover cost
- Helps determine your price floor
  - Cash cost
  - Total cost (economic cost)
- Custom operations or own equipment?

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Break-Even Analysis

- Profit Equation

$$Profit = (Price * Quantity) - (Unit\ Operating\ Cost * Quantity) - Total\ Fixed\ Cost$$

- Given Price: Quantity to break-even ($0 profit)

$$Quantity = \frac{Total\ Fixed\ Cost}{Price\ - Variable\ Cost}$$

- Given Quantity: Price needed to break-even

$$Price = \frac{(Unit\ Operating\ Cost * Quantity) + Total\ Fixed\ Cost}{Quantity}$$

- Price after taxes – solve for Quantity or Price with profit = $0.

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Tomato Budget – Break-Even Price Analysis

Enterprise Budget for 14' x 100' Tomato Bed

Revenue Product	Quantity	Unit	Price	Total	% of Revenue
Individual product	*number sold*	*size of unit*	*price per unit*	*Total revenue*	
Tomatoes Average Price	450	lbs	$ 1.50	$ 675.00	100%
Total Revenue				**$ 675.00**	100%
Expenses					
Materials				$ 129.00	
Labor				$ 530.00	
Marketing				$ 20.00	
Ownership Expenses (Fixed Costs)				$ 125.00	
Total Expenses				**$ 804.00**	119%
Net income before taxes (revenue minus expenses)				**$ (129.00)**	-19%
Income and self employment taxes				$ (19.35)	-3%
Net profit				**$ (109.65)**	-16%

Different break-even points:

- Cover variable costs
  - Variable Expenses / Quantity = Break-even price point
  - $679/450 = **$1.50 per lb.**
- Cover variable and fixed costs
  - (Variable + Fixed) / Quantity = Break-even price point
  - ($679+$125) / 450 = **$1.78 per lb.**

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Tomato Budget – Break-Even Quantity Analysis

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Product					
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Net profit				**$ (109.65)**	-16%

Different break-even points:

- Cover variable costs
  - Variable Expenses / Price = Break-even quantity point
  - $679/$1.50 = **452 lbs.**
- Cover variable and fixed costs
  - (Variable + Fixed) / Price = Break-even quantity point
  - ($679+$125) / $1.50 = **536 lbs.**

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Partial Budgeting

- What is partial budgeting?
  - Budget that only includes those resources that will be changed
- When is it used?
  - Helps producers evaluate the financial effect of incremental changes
    - Adding land
    - Expanding or reducing
    - Changing management strategies

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Partial Budgeting

- Key principle of partial budgeting is that small agricultural changes have effects in one or more of the following areas
  - Increased income
  - Reduction or elimination of costs
  - Increased costs
  - Reduction or elimination of income

- **Key Decision Criteria**
  - Net impact is equal to the positive financial changes minus the negative financial changes

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Partial Budgeting

Partial Budget: Define the change analyzed			
Benefits		Costs	
Additional Revenues What will be the new or added revenues?		Additional Costs What will be the new or added costs?	
Costs Reduced What costs will be reduced or eliminated?		Revenues Reduced What revenues will be reduced or lost?	
Total Benefits		Total Costs	
		Net Benefit	

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Example

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Partial Budgeting Example: High Tunnel

Table 1. Comparison of High Tunnel and High Tunnel + Low Tunnel for 'Seascape'

Revenues	
High Tunnel Only	
Early Out-of Season Strawberries	$ 1,336.21
In-Season Strawberries	$ 1,705.86
High Tunnel Only Total	$ 3,042.07
High Tunnel + Low Tunnel	
Early Out-of Season Strawberries	$ 1,799.87
In-Season Strawberries	$ 2,536.61
High Tunnel + Low Tunnel Total	$ 4,336.49
Costs	
Added Costs of Low Tunnel	
Annual Supplies	
2 mil Plastic (10 x 300')	$ 81.00
Bailing Twine	$ 8.55
Labor	
Installation and Removal (7.75 hrs)	$ 77.50
Annual Depreciation of Low Tunnel	$ 23.75
Total	$ 192.47
Resulting Change in Net Income	
Difference in Revenue	$ 1,294.41
Difference in Costs	$ (192.47)
Total Change	**$ 1,098.94**

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Partial Budgeting Example: High Tunnel

Table 2. Comparison of High Tunnel and High Tunnel Plus Low Tunnel for 'Chandler'

Revenues	
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Early Out-of Season Strawberries	$ 2,151.81
In-Season Strawberries	$ 1,821.96
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Total	$ 192.47
Resulting Change in Net Income	
Difference in Revenue	$ (387.54)
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- Thinking in Time

Time Value of Money

Interest Rates

Today
Initial period of investment

Future period-
End of investment

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Time Value of Money

- Investment analysis requires an understanding of the mathematics of TVM
  - Money intrinsically has a time value associated with it
    - Individuals value a given amount more highly the earlier it is received
- Time Value of Money Definition
  - *Deals with the equivalence relationships between cash flows with different dates*

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- Why Time Value of Money?
- *Investment*
  - An outlay of cash in exchange for expected future cash returns.
- By converting future cash flows to their present cash equivalent, present value models provide decision-makers with information need to make investment decisions.

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Time Value of Money

- Opportunity Cost
  - Value that investors forgo by choosing a particular course of action
  - Return that would be required of an investment to make t a viable alternative to other, similar, investments
  - Future applications
    - Risk-adjusted discount rate
    - Weighted average cost of capital

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Net Present Value

Net Present Value

Present value and the cost of acquired the asset (cash flow at time zero)

$$NPV = \sum_{t=0}^{N} \frac{CF_t}{(1+r)^t} = CF_0 + \sum_{t=1}^{N} \frac{CF_t}{(1+r)^t}$$

Now suppose that the previous example had an initial cost of $250, what is the NPV?

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- Decision Criteria
  - Net Present Value (NPV)
  - Internal Rate of Return (IRR) -- Yield
  - Payback
  - Simple Rate of Return

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NPV = PV(Cash inflows) - PV(Cash Outflows)

$$NPV = \sum_{n=1}^{N} C_n (1+r)^{-n} - C_0$$

C_0 = Initial Cost of Investment

C_n = Net Cash Flow at time n

N represents the maturity of the investment

Note: C_N includes the terminal value of investment

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NPV --Rule (profitability)

If NPV $\geq$ 0 Then acceptable

If NPV < 0 Then unacceptable (Reject)

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Internal Rate of Return (IRR)

Set NPV = 0; Solve for r

Yield or Rate of Return on Investment

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Recap

- What is your plan?
- How do you measure profit?
- How do you analyze changes to your business?

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Questions

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