

Enterprise Budgets

Farms have a burden that many other kinds of business don't have. In addition to understanding what it takes each month to run the farm and pay the owner, smartly-run farms will understand the profit potential of each crop or product, and what it takes to earn that profit.

Enterprise budgets have long been used to create a model of the costs and income a crop might produce in a certain place and time. But most existing enterprise budgets make huge assumptions: that a farmer is growing only one crop; that the farmer is selling that crop into the global food supply through a local packing house or cooperative distributor; that the farmer is using the same equipment and chemicals as many other farmers growing the same thing in the same way in the same region; that the farmer is not doing anything to add value to this crop before selling it.

In this workshop, we'll focus on a different kind of beast: enterprise budgets for farmers who may be growing many different crops and selling them in many different ways.

Because enterprise budgets are about a specific crop, if you are trying to grow/raise/produce multiple crops, you must leave out costs that are inseparable from the whole farm, such as:

- land payment
- owner's pay
- fencing maintenance
- loan payments
- utility payments
- travel to market for multiple crops
- and so on

So what do enterprise budgets track?

- crop-specific input costs (seed, stakes, fertilizer, mulch, feed, flats, chemicals, etc.)
- crop-specific labor costs (planting/weeding/harvesting/milking/etc.)
- value-added costs (packaging, added ingredients, processing)
- travel, advertising, and other support costs, if they can be tied to the specific crop in question. For example, if you are only growing strawberries for u-pick, and vegetables for market, you could put the advertising costs for the u-pick into your strawberry enterprise budget.

Enterprise Budgets that Work for Today's Farms

Below is an example of a typical good-old enterprise budget (Penn State). There's nothing wrong with this example. It does a great job figuring the costs per acre for growing peppers.

Fresh Market Bell Pepper Budget

Summary of estimated costs and returns per acre.

Item	Quantity or number of operations	Unit	Price	Total	Your Estimate
Variable costs					
Custom					
Applying calcium lime	0.5	ton	\$20.00	\$10.00	_____
Pest scouting	8	acre	\$10.00	\$80.00	_____
Pesticide spraying	8	acre	\$7.20	\$57.60	_____
Preapplied fertilizer (10-10-10)	0.2	tons	\$180.00	\$36.00	_____
Fertilizer (postapplication)					
Nitrogen	40	pound	\$0.22	\$8.80	_____
Phosphorus	40	pound	\$0.28	\$11.20	_____
Potassium	80	pound	\$0.15	\$12.00	_____
Herbicide					
Command	0.125	gallon	\$83.00	\$10.4	_____
Dual 8E	0.15	gallon	\$93.90	\$14.09	_____
Fungicide					
Ridomil Gold	1	pint	\$89.00	\$89.00	_____
Kocide	12	pound	\$3.15	\$37.80	_____
Manzate 200DF	10	pound	\$2.75	\$27.50	_____
Insecticide					
Asana XL	0.069	gallon	\$111.00	\$7.66	_____
Diazinon	0.75	gallon	\$31.00	\$23.25	_____
Baythroid	0.17	pound	\$465.00	\$79.10	_____
Admire	0.18	pound	\$561.00	\$100.98	_____
Other variable costs					
Preapplied fertilizer (10-10-10)	0.2	tons	\$180.00	\$36.00	_____
Disk plowing	1	acre	\$11.80	\$11.80	_____
Cultivation	2	acre	\$8.30	\$16.60	_____
Black, embossed, or silver mulch	1	acre	\$250.00	\$250.00	_____
Drip irrigation (tape and labor)	1	acre	\$150.00	\$150.00	_____
Pepper transplants	18	thsd	\$75.00	\$1,350.00	_____
Labor	48	hour	\$10.00	\$480.00	_____
Marketing and advertising	1	acre	\$100.00	\$100.00	_____
Hand harvesting	1	acre	\$700.00	\$700.00	_____
Packing and grading	1	acre	\$180.00	\$180.00	_____
Cartons	1,100	cartons	\$0.90	\$990.00	_____
Fuel	10.21	gallon	\$0.93	\$9.50	_____
Pest control including labor	8	acre	\$7.20	\$57.60	_____
Repair and maintenance					
Tractors and implements	1	acre	\$15.00	\$15.00	_____
Irrigation labor	1	acre	\$30.00	\$30.00	_____
Interest charge	1	acre	9.5%	\$117.61	_____
<i>Total variable cost</i>				\$5,099.40	_____
Fixed costs					
Tractors	1	acre	\$15.86	\$15.86	_____
Implements	1	acre	\$12.32	\$12.32	_____
Drip irrigation	1	acre	\$500.00	\$500.00	_____
<i>Total fixed cost</i>				\$528.18	_____
Total cost				\$5,627.58	_____

This type of budget is for a specific kind of farmer, and it is very useful. It ends with the small chart below, that tells the farmer how much they will make per acre in a good year, and how much they will lose in a bad one.

Net returns for five different yields and prices.

Price	Yield (cartons)				
	600	850	1,100	1,250	1,400
\$5.00	-\$2,628	-\$1,378	-\$128	\$622	\$1,372
\$6.50	-\$1,728	-\$103	\$1,522	\$2,497	\$3,472
\$8.00	-\$828	\$1,172	\$3,172	\$4,372	\$5,572
\$9.00	-\$228	\$2,022	\$4,272	\$5,622	\$6,972
\$10.00	\$372	\$2,872	\$5,372	\$6,872	\$8,372

It is a helpful exercise to understand **how** they get the numbers in this chart. This is how it works:

$$(\text{Yield per acre (cartons)} \times \text{Price per carton}) - (\text{costs per acre}) = \text{profit}$$

Let's walk through an example:

In a decent year:

$$\begin{aligned} & (1100 \text{ cartons per acre} \times \$8/\text{carton}) - \$5627 \text{ costs per acre} = \\ & \$8800 - \$5627 \\ & = \$3173 \text{ per acre in profit.} \end{aligned}$$



**Enterprise
Budgets,
Continued**

In a lousy year:

$$\begin{aligned} & (600 \text{ cartons per acre} \times \$5/\text{carton}) - \$5627 = \\ & \$3000 - \$5627 \\ & = \$2627 \text{ per acre in loss.} \end{aligned}$$

You can also turn this equation around slightly to figure out a **break-even point**. Break-even analysis tells you how much of something you need to sell (or at what price you need to sell something) to cover all your costs and have no extra money (profit) left.

Break-Even Yield

For the peppers, let's say you know you can sell them for \$8 a carton. Here's how you would figure out your yield to break even:

$$\text{total costs per acre} / \text{price per carton} = \text{the break-even point in cartons per acre}$$

$$\$5627 / \$8 = 703 \text{ cartons per acre to break even}$$

Each carton produced beyond 704 gives the farmer a profit.

Break-Even Price

Let's say you know the yield of your pepper crop - that you're going to harvest 1,000 cartons per acre, and you want to figure out what price per carton you need to get to cover costs:

$$\text{total costs per acre} / \text{yield per acre} = \text{the break-even point in dollars per carton}$$

$$\$5627 / 1000 \text{ cartons} = \$5.63 \text{ per carton to break even.}$$

Every penny of price increase over \$5.63 brings a penny of profit per carton to the farm.

Now, our key question is how do we adapt this kind of figuring to smaller-scale, mixed operations. Here are some key changes you'll have to make

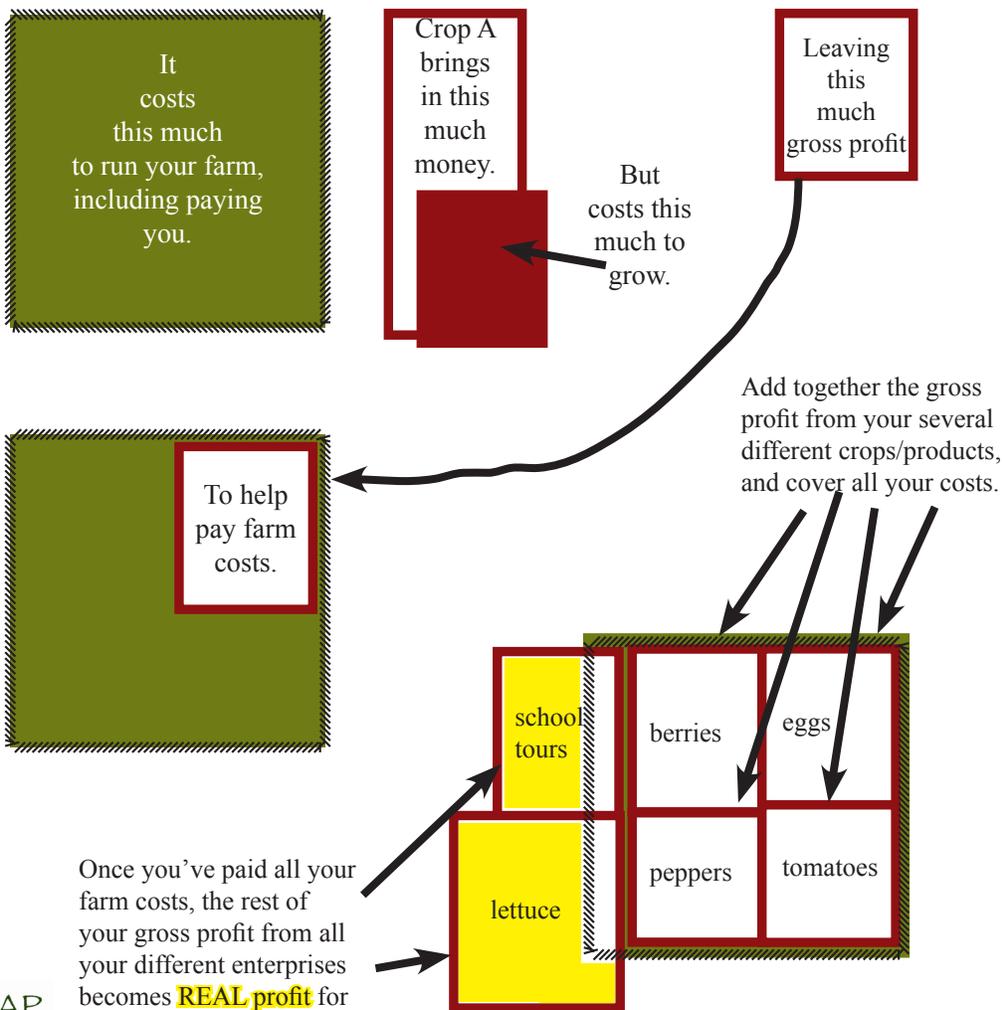
If your operation is not only diversified, but also very small scale:

- you'll have to do your figuring per row, bed, row-foot, animal, or pound, instead of per acre.

If you produce a wide range of farm products:

- you'll have to do lots of different enterprise budgets.
- you'll have to figure your overall costs for your farm separate from each enterprise. For example, in the Penn State budget for peppers, the cost of tractor maintenance is figured per acre of peppers. Penn State can do this because they assume a pepper farmer just grows peppers. This doesn't work if you grow 20 different crops because the tractor maintenance is need for ALL of them, not just ONE of them.
- in the end, you'll have to combine all of your crops together (along with processed products, services, etc.) to figure a break-even point.
- you won't break even until your each crop has not only paid for the seed, fertilizer, labor, packaging, etc. that it took to produce it, but has also contributed its fair share toward the overall costs of running the farm and paying you (the owner).

This is how it works:



Try creating your own enterprise budget for one thing that you sell. Tips:

- Combine crops/products if appropriate. Example: if you sell carrots, beets, and turnips all for about the same price per bunch, and the costs of growing the crop are about the same, combine these into an enterprise called “root crops.”
- If it’s easier to think of any one cost as applying to the whole farm, don’t worry about including it in the enterprise budget. Example: if you spread manure or compost or lime on all your land once a year, you can include that in your farm’s overhead cost rather than trying to tie it to each specific crop.
- If you don’t know right now, just guess.

Crop: _____ **Amount of** _____ **Production:** _____

Income	Yield	Unit	Price	Income
Direct to consumer				
Wholesale				
Other type of sale: _____				
Other type of sale: _____				
Other type of sale: _____				
Total Income				

Direct Expenses				Expense
Seeds				
Insect Control item A				
Insect Control item B				
Fertilizer A				
Fertilizer B				
Animal Expenses				
Other _____				
Labor task A _____				
Labor task B _____				
Labor task C _____				
Hired Labor _____				
Other _____				
Marketing Costs				
Packaging Costs				
On-farm fuel				
Delivery/marketing fuel				
Total Expenses				

Income Less Direct Expenses				
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Worksheet 1

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Labor, Delivery, Farmers' Market, and Overhead Costs to Use in Calculating Crop Budgets

OGS Note: You can use this process for your farm, but not necessarily with these same numbers.

Labor Costs:

Average hourly rate:
Employee taxes: 7.51%
Workers' comp: 8%
Nonassigned time: 10%
SEP-IRA: 25%
Labor costs/hour:

Manager	Crew	Composite crew 1:3
10.00	10.00	10.00
0.75	0.75	0.75
0.80	0.80	0.80
1.00	1.00	1.00
		0.00
12.55	12.55	12.55

Labor costs are critical to calculating crop budgets. The farm's labor cost per hour is more than the employee's wage when employer taxes, workers' comp insurance, and nonproduction time (meetings, cleanup, maintenance) are added in. The SEP-IRA is an optional retirement plan, which is an added cost for certain qualifying employees (see chapter 6). If a farm manager is at a different pay rate, a composite rate per hour can be used. This worksheet assumes a ratio of 3 crew workers to 1 manager. For simplicity, all labor is paid the same rate in these crop budgets.

Delivery Costs:

Labor: load truck(s) and travel
Vehicle(s) cost at .40/mile

Produce
25.10
8.00

@12.55/hr
20 miles round trip

Delivery costs can be determined for each trip, total trips per season, or the percentage cost of each product delivered. If a delivery contains equal amounts of carrots and beets, 50% of the delivery cost would be allotted to each crop.

Cost for one delivery
% of crop to total load
x number of trips

33.10
10%
12
39.72

for example
for example

Delivery cost for crop per season:

Farmers' Market Costs:

Labor: load truck(s)
Labor: travel to market, set up
Labor: market vending
Labor: pack up, travel home,
unpack, tally sales
Vehicle(s) cost at .40/mile
Rental fees
Amortized FM equipment

12.55
50.20
100.40
37.65
8.00
30.00
7.67

Calculate for ONE market
1 hr (2 people @.5 hr each)
4 hrs (2 people)
8 hrs (2 people)

The base cost for attending one market is constant irrespective of the amount of product sold (unless labor needs change). Gross sales at market must be higher than the cost; otherwise, you are losing money or personally subsidizing the market cost by not paying yourself the going labor rate. Sales need to be high enough to justify the cost of vending at market. If they are not, strive for higher sales or pursue alternative selling venues, such as CSA programs or wholesale accounts.

3 hrs (2 people)
20 miles round trip
per market
scales \$1500, umbrellas \$400, tables \$200, signs \$200 =
\$2300/15-year useful life/20 markets per season = \$7.67 per market

Subtotal, cost for one market:

246.47

of markets where crop is sold

6

varies by crop

The total expense for equipment needed at market is amortized over the useful life of the equipment and prorated for each market. As with delivery costs above, a percentage of farmers' market expense can be assigned to different crops. The important message regarding farmers' market costs, though, is that each market costs a certain amount to attend, and that farmers' market sales must justify that expense.

Total costs for # of markets

1478.82

Crop sales/total FM sales

5%

varies by crop

Crop sales % x total market costs:

73.94

Enter in Crop Enterprise Budget under
"Marketing Costs: Farmers' market expense"

Overhead Costs (annual)

Overhead costs are ones not accounted for in delivery costs, farmers' market costs, greenhouses, tractors, implement, or irrigation costs. Overhead costs are spread out over the entire farm operation and prorated to each crop or enterprise. In these worksheets, 75% of overhead expenses are apportioned to the 5 acres in cultivation, 12.5% to the bedding-plant greenhouse, and 12.5% to the in-ground tomato greenhouse. Allotment of overhead costs is somewhat subjective, but all overhead costs must be assigned. Overhead expenses allotted to the cultivated 5 acres is further broken down to overhead expense per two 350'-long beds, the equivalent of 1/10 acre.

Mortgage annual payment	600.00	farm % of total bill. Does not include house and house site portion.
Depreciation	2000.00	to account for replacement costs, excluding machinery in Worksheet 4
Property taxes	800.00	farm %
Insurance	4000.00	\$3000 health, \$1000 fire; not vehicle or workers' comp.
Office	1100.00	supplies, postage, subscriptions
Website	400.00	\$20/month plus fees and maintenance
Travel/conferences	300.00	
Professional services	700.00	CPA, organic certification, snowplowing
Electric	600.00	farm % w/o greenhouse electrical use
Landfill	250.00	
Telephone	550.00	farm %
Advertising	200.00	
Shop supplies, misc. repairs	500.00	tractor, implement, irrigation repairs already accounted for in Worksheet 4
Labor: management	3263.00	average 5 hrs/week, 260 hrs/year; annual labor for overseeing farm operation
Labor: office	3263.00	average 5 hrs/week, 260 hrs/year; annual labor for office duties
Labor: maintenance	653.00	average 1 hr/week, 52 hrs/year; annual labor for nonassigned maintenance work

Total overhead costs:

19179.00 Allocation: GH seedlings \$2397, GH tomatoes \$2397, 5A (100 beds) \$14,385 = \$144 per bed

Overhead per two 350' beds:

288.00 Per two 350' beds, for 5A (100 beds) planted to row crops. Enter on line 69 on Crop Enterprise Budget.

Overhead per greenhouse:

2397.00 Per 21' x 96' hoophouse: one for bedding plants, one for greenhouse tomatoes

Worksheet 4 Tractor, Implement, and Irrigation Costs

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(ASAP note: we have excerpted a few worksheets. Buy the book for all of them.)

(ASAP note: this is one farm's example. You can use this *process* with your farm, but not necessarily the same *numbers*.)

Tractor Costs

The hourly cost of a tractor is calculated by first dividing the purchase price of the tractor by the tractor's years of useful life. Next, annual expenses for repairs and fuel are added in, giving you the total cost to own and operate the tractor per year. Divide this total annual cost by the number of hours the tractor runs in a year, and the result is an average cost per tractor hour. I was surprised at first at how inexpensive running a tractor can be, but remember, a tractor used 50 hours per year has a much higher hourly rate than a tractor used 300 hours per year. The three tractors shown below are ones that I have owned, and the numbers are based on personal experience. Annual repairs are listed as an average: some years are expensive, some are not.

Tractor model	JD 2240	Ford 4000	Cub
<i>Original cost/useful life</i>	7000/25	4400/25	1000/25
Annual cost, w/o interest	280.00	176.00	40.00
Average annual repairs	500.00	300.00	200.00
Annual fuel cost @ \$3/gallon	480.00	480.00	80.00
Total annual cost	1260.00	956.00	320.00
Hours used annually	200	300	60
Tractor cost/hour	6.30	3.19	5.33
Tractor driver hourly rate	12.55	12.55	12.55
Tractor with driver: \$/hour	18.85	15.74	17.88

Implement Costs

Tracking various implements' costs is similar to tracking costs of tractors but without the fuel expense. Some implements have lots of moving parts (e.g., combines, manure spreaders) and cost more to operate than implements like a bedlifter, which has no moving parts. I list three of the more common and costly implements to run. Because a farm may have numerous implements, I make a note below these three implement costs for easy calculations to use as a shortcut for budget work.

	PTOTiller	Manure Spreader	Brush Hog
<i>Original cost/useful life</i>	800/25	1100/20	600/20
Annual cost, w/o interest	32.00	55.00	30.00
Implement annual repairs, average	20.00	20.00	20.00
Annual hours used	40	20	50
Implement cost/hour	1.30	3.75	1.00

A \$500 simpler implement with a useful life of 25 years costs about \$20/year to own. Figure \$.50/hour for quick calculating.

A \$1000 simpler implement with a useful life of 25 years costs about \$40/year to own. Figure \$1/hour for quick calculating.

Irrigation Costs

Irrigation costs take into account the annual equipment cost and any repair expense (similar to tractors and implements) and also time for setting up, running, and taking down (or moving) the system, calculated for the area that is watered each time. The example below shows an irrigation system that waters an acre in area and is used four times per season. The irrigation cost per acre is then calculated for 1/10 of an acre, or two 350'-long beds.

Cost of pipe, pump, sprinklers	4600.00	used PTO (power take-off) pump, 4" and 2" aluminum pipe for 1 acre
Useful life in years	25	
Annual equipment cost	184.00	
Average annual repairs	50.00	say \$250 every 5 years
<i>Total annual cost</i>	234.00	
Total annual cost/uses per season	58.50	4 uses per season
Setup, takedown labor per irrigation area	75.30	1A coverage, 6 hrs total @ \$12.55/hr
4 hours tractor use	25.20	at \$6.30/hr, tractor only
Irrigation costs/irrigated area, each use	159.00	per acre
Irrigation costs for two 350' beds, each use	15.90	\$7.53 labor, \$8.37 machinery

from: *The Organic Farmer's Business Handbook*, Richard Wiswall, Chelsea Green Publishing, reprinted with permission of author.

OGS Note: You can use this process for your farm, but not necessarily with these same numbers.

TABLE 3-3: Simple Crop Budget: Carrots			
Five 350' beds, 3 rows/bed Location: Lower field Not including fixed costs; for comparing crops only			
Expenses			
	Labor Cost	Machinery Cost	Product Cost
Prepare soil			
Spread 1 load compost	\$6.28	\$2.50	\$100.00
Spread 75 lb SoPoMg	3.14	1.25	18.00
Spread 200 lb bagged poultry compost	3.14	1.25	40.00
Disk 1x	3.14	1.25	0
Chisel and bedform beds	6.28	2.50	0
Seed/transplant			
Plant 125,000 seeds	12.55	0	79.00
Cultivation			
Flame weed	6.28	2.50	8.00
Cultivate with baskets 3x	16.73	3.75	0
Cultivate with sweeps 2x	6.28	2.50	0
Irrigate 1x	18.83	10.00	0
Hand-weed 3x (32 hours)	401.60	0	0
Cultivate wheel tracks 1x	3.14	1.25	0
Harvest			
Bedlift 2 beds	9.43	3.75	0
Harvest (47 hours)	589.85	0	0
Wash, sort, pack (200 25-lb bags, 29 hours)	363.95	0	50.00
Post-harvest			
Disk 1x	3.14	1.25	0
Seed 25 lb oat cover crop	9.43	3.75	22.00
Total expenses	\$1,463.19	\$ 37.50	\$317.00 = \$1,817.69

Income			
Sales	# of 25-lb Bags	Price/Bag	Total \$
Retail	40	\$43.75	\$1,750.00
Wholesale	160	25.00	\$4,000.00
Total sales			\$5,750.00
Net profit per ¼ acre \$5,750.00 - 1,817.69 = \$3,932.31 without fixed costs			

Penn State Enterprise Budgets

<http://agalternatives.aers.psu.edu>

- These budgets are adaptable to all types of enterprise and locations. Simple and clear, maybe a little too simplified. Includes a profitability analysis and a whole range of different enterprise budgets

NC Enterprise Budgets

List of NC enterprise budgets, mostly large-scale/conventional

http://www.ag-econ.ncsu.edu/extension/Ag_budgets.html

Vegetable budgets: <http://www.ag-econ.ncsu.edu/AgBudgets/vegetable.htm>

SC Enterprise Budgets

http://cherokee.agecon.clemson.edu/f&v_bud.htm

List of SC vegetable budgets, mostly large scale, but by season, clear short budgets, easy to understand

GA Enterprise Budgets

List of enterprise budgets <http://www.ces.uga.edu/Agriculture/agecon/interactive.htm>

- These are a good example for enterprise budgeting **online**. Includes an online budget calculator (similar to excel). It can be adapted for a small scale. There are only budgets for tomatoes, squash, and livestock.

Record-Keeping

Tennessee Whole farm record keeping publication under: business/farm finances and direct marketing guide for producers of fruits and vegetables

<http://www.utextension.utk.edu/publications/financial/default.asp#business>

Tennessee Direct marketing guide for producers of fruits and vegetables provides a section on developing a business plan <http://www.utextension.utk.edu/publications/financial/default.asp#business>

Whole-Farm Business Planning Guide

Direct Farm Marketing Example: Preparing a Business Plan: A Guide for Agricultural Producers

http://www.agf.gov.bc.ca/busmgmt/bus_guides/direct_guide.htm

From the BC Ministry of Agriculture, a step by step guide for farmers on preparing a business plan for direct farm marketing. Includes a list of planning resources: Production plan, Human resources, financial plan, marketing plan etc.

A sample business plan for an herb enterprise is available at www.smallbusinessbc.ca/pdf/sample_primary.pdf. This is a model business plan for a non-existent business. “tiny tim’s herbs”

****Minnesota Institute for Sustainable Agriculture*: Building a Sustainable Business: A Guide to Developing a Business Plan for Farms and Rural Businesses

<http://www.misa.umn.edu/vd/bizplan.html>

And remember: ASAP is here to help you with your farm business plan. We can come to your farm if you are in the southern Appalachian region.

Contact (828) 236-1282 or peter@asapconnections.org.