100 Acre Farm Reconstruction Plan

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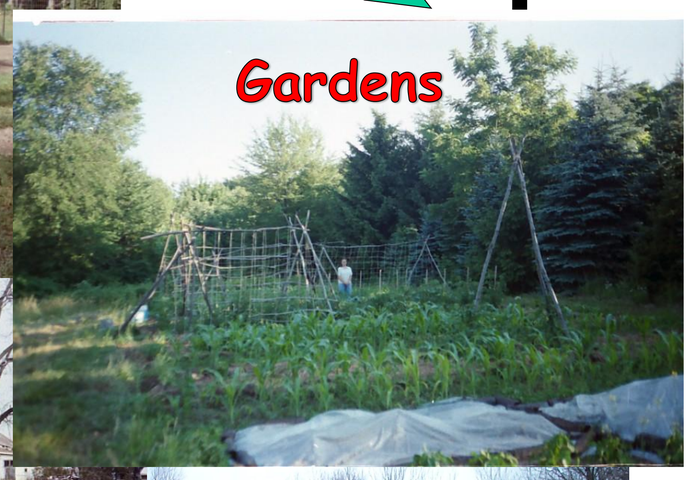
The Purpose of The Project

Agriculture is becoming one of the worlds most important industry. The problem is that we are starting to lose that industry to urbanization as towns and cities continue to expand. It is becoming increasingly important to make use out of every acre of land not only to make high profits from high yields per acre but to also help feed the people of the world.

This is where we come in… our sponsor Kimberly Orr owns a small 100 acre farm in Emlenton, PA. This farm was once a productive system but because of time it is now just empty land. The goal for this project was to produce a simple step by step plan that our sponsor can use to set up a new sustainable farm system and give her the materials needed to manage it. We also wanted to make her a profit and losses analysis so that she can decide for herself if this system is worth her time and money.

Past Practices On System

This system was a productive farm for the longest time but because of time it has fallen apart. Built in 1898 this farm produced a plethora of different goods and services. It had a blacksmith shop to shoe horses and make machinery, its barn housed many different kinds of tillage equipment for corn and hay, and it had many different chicken coops. This farm continued to be productive till the 1950's when it was bought by the Eichenmiller family who sat up a sylvaculture system of Hardwoods and Christmas trees. This is when things started to fall apart. The Barn due to time and poor construction caved in, the coops rotted away and the fields were retaken by nature. In 1985 the farm was given to the Orr Family. Kimberly Orr did her best to try and turn this farm into a productive system but without the knowledge and information she needed she was going at the systems in the blind. Some of the systems she restarted were chickens, pigs, beans, and sweet corn. Today the farm sits unused. Kimberly Orr is sponsoring us in hopes to restore this farm to working order. Using what she already has from the past operations and what we have learned throughout our college experience we have successfully created a plan that she can use.



Sponsor Preferences and Stipulations

Our Sponsor loves nature and is intrigued by organic farming. This is one of the big preferences she had for us. She wanted the systems to be grown as naturally as possible. This means we had to minimize the amounts of outside fertilizers, insecticides, and herbicides. She also desired to have free ranged chickens as we set up our systems. Working with her we set up a system that had a cyclical nature where products or wastes from one system went in to feed or fertilize other parts. Finally this farm is not the sole source of income that our sponsor has so we developed a plan that will require as little time of her as possible. This will allow her to work on the farm after she gets off work and still have time to do fun things. These stipulations were all considered and put in our plan to make a custom system built around what she wants and needs.

Agriculture Systems Management

Poster Developed by Isaac Serbin and Matt Cohill

Resources Available

This system was a farm for the longest time and has acquired some tools that will be useful to our sponsor in this plan. We made sure we reduced the start up cost for our sponsor by using resources and equipment already available on or near the farm. We decided to take advantage of the mobile coops she constructed for her chickens from previous years, her new John Deere 3203 tractor and tillers, electric fencing, and the farms old sylvaculture system and many other tools and resources that were already available for her to use. This reduced our start up costs to $2019.18 per year making the setup of this farm possible for her even in today's economy.

Customized Setup, Instructions, and Management Materials

This system plan is customized for the farm in Emlenton, PA owned by the Orr family. The plan includes step by step instructions showing in detail how to set up and produce the products for each system. This plan also has appendices of budgets and calculation tables that the sponsor can use to manage her farm's profits and losses. Finally the plan will give information on suppliers and buyers in her area so she can start the systems and market her products.

Alternative Ideas

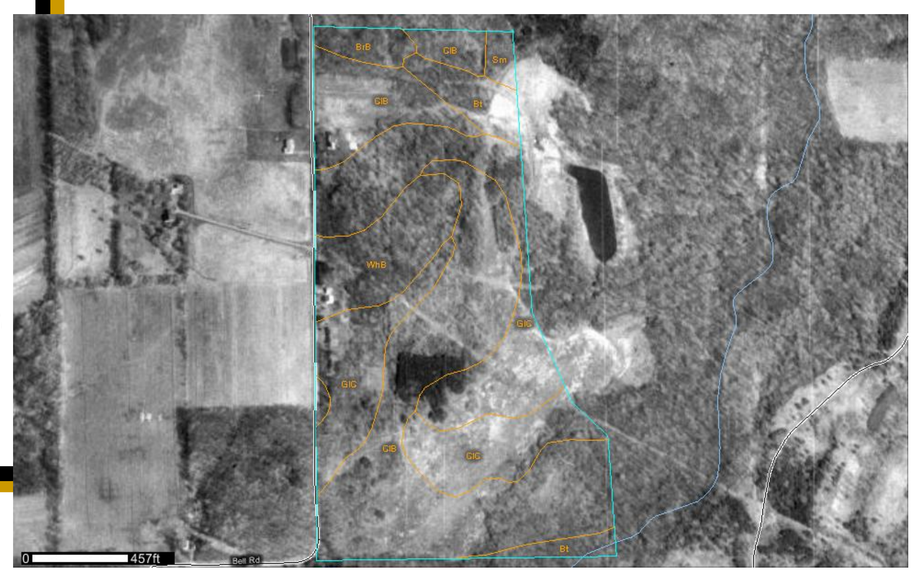
This system just didn't pop out of no where. There was a lot of time put into deciding what systems would have been right for her, based on what she wanted and needed. Some systems we though she could do were garlic production, goats, cherry trees, pigs, beef, buffalo, and apricots. All these systems were good for her in her area but were rejected by either our sponsor or us because of their requirements. Some of them can still be possibilities for her in the future if she wants to use them like cherry trees, goats, and apricots.

Final Purposed System and Advantages

We have concluded that for this system we should produce Apples, Worms through vermiculture, Chickens, and Asparagus. We chose these systems for their relative ease to setup and upkeep. Each one has some work involved but the work doesn't have to be done all at once or can be put off for a day when our sponsor has time to work. In the case of chickens and the asparagus watering or feeding is an everyday chore but we have them both in small enough numbers to where it doesn't take very long to do this job. We also chose these systems for their relative ease to be used or sold somewhere in the area. Auctions, farmers markets, and small restaurants are in great abundance in her area making each of these systems easy to grow and sell. With a little extra care our sponsor will also get instructions to sell her products with the organic stamp making her goods even more valuable to anybody in her area or the city of Pittsburgh, which is only an hour away. These products are also hearty systems. They are hard to kill and if she follows our step by step instructions she should be able to set up these systems and keep them going for years to come.

System Integration

In our system we have multiple production components. Each part is integrated with each other where the products or wastes of one system feeds another. In this system the heart of it all is the vermiculture/ vermicompost production. Leaves from the apple orchard, yard waste from the asparagus, manure and slaughter wastes from the chickens, and household food waste are all put into the vermiculture system where it is broken down into organic fertilizer compost. This compost is used to fertilize the asparagus and apple systems making outside fertilizer needed minimized. Even the worms that are used to break down the compost is eaten by the chickens when the compost is harvested to give the chickens an added vitamin and protein boost. This give our farm plan a unique cyclical system reducing costs and wastes.



Risk, Market, Cost, and Revenue Analysis

In the final plan, we will give to our sponsor, it will have all the tools she would need to decide if this system is right for her before she starts it, after its set up and running, and even in the future when a new system comes along. We have researched and given today's prices on the markets in her area and where she can sell and buy in her area. We have given her tables of costs versus revenue in our plan and the different suppliers and wholesalers competing prices and budgets. Our research shows that once this farm is up and running she will make $5731.00 worth of profit each year using today's market prices. This is based off the idea that if she sold everything she would produce and losses are at a minimum.

We have also given her risk matrixes, that we have filled out and planed backup plans, for each system in case something goes wrong. We also supplied a blank risk matrix including instructions on how to use one that she can fill out and plan for problems that we may have not mentioned. We done everything we could to show her everything she needs to know to make a good decision about her farm.

Probability-Impact Risk Assessment Matrix

Your Risk Assessment

PROBABILITY	Low	Medium	High
High			Scab and Mildew disease outbreak
Medium	Not enough time to complete management tasks		Insect damage to fruit Lower than expected yield Unable to find good market
Low		Mechanical damage to trees Injury	Not able to full-fill organic guidelines Equipment failure chemical spill Under estimate costs

IMPACT

Asparagus Budget for Establishment Year (Asparagus does not yield until the second year.)

Summary of estimated costs and returns per acre.

Item	Quantity or number of operations	Unit	Price	Total	Your Total Estimate
Variable costs					
Custom					
Applying calcium lime	1	ton	$20.00	$20.00	_____
Disking	1	acre	$4.00	$4.00	_____
Disking and harrowing	1	acre	$9.40	$9.40	_____
Tons of manure (incorporated)	5	acre	$10.00	$50.00	_____
Bed establishment	1	acre	$20.00	$20.00	_____
Pest scouting	2	acre	$10.00	$20.00	_____
Pesticide spraying	2	acre	$7.20	$14.40	_____
Fertilizer					
Nitrogen	60	pound	$0.22	$13.20	_____
Phosphorus	150	pound	$0.28	$42.00	_____
Potassium	50	pound	$0.15	$7.50	_____
Fungicide					
Ridomil Gold	4	pint	$89.00	$356.00	_____
Herbicide					
Gramoxone extra	0.375	gallon	$29.40	$11.00	_____
Fusilade	0.09	gallon	$121.50	$11.39	_____
Insecticide					
Methoxychlor 2E	0.75	quart	$16.60	$12.45	_____
Other variable costs					
Asparagus transplants	8.4	thousand	$65.00	$546.00	_____
Non-irrigated labor	11	hour	$10.00	$110.00	_____
Fuel	5	gallon	$0.93	$4.65	_____
Repair and maintenance					
Tractors and implements	1	acre	$5.00	$5.00	_____
Interest charge	1	acre	9.5%	$29.85	_____
Total variable cost				$1,286.85	_____
Fixed costs					
Tractors	1	acre	$15.86	$15.86	_____
Irrigation (drip)	1	acre	$500.00	$500.00	_____
Implements	1	acre	$12.32	$12.32	_____
Total fixed cost				$528.18	_____
Total cost				**$1,815.03**	_____

To sum it all up:

We have learned a great deal, doing this project, of the things you may never think about on your own. As we went through this project we were coming up with different possibilities and different systems that could have worked out even better than what we planned! The problem is that there is not enough time for us to do all the research require to put together the perfect system for this farm, considering and combining all the different possibilities out there. We did our best and came out with a good plan we just wish we had more time. This project was a good experience for us giving us a taste of what some people do for a living and what a graduate student may write when they are writing their dissertation.