

A photograph of a community garden. In the foreground, a person with brown hair tied back, wearing a light-colored t-shirt and khaki pants, is crouching and tending to a row of green leafy plants. In the background, two other people are visible working in similar rows of plants. The sky is blue with large, white, fluffy clouds. The overall scene is bright and sunny.

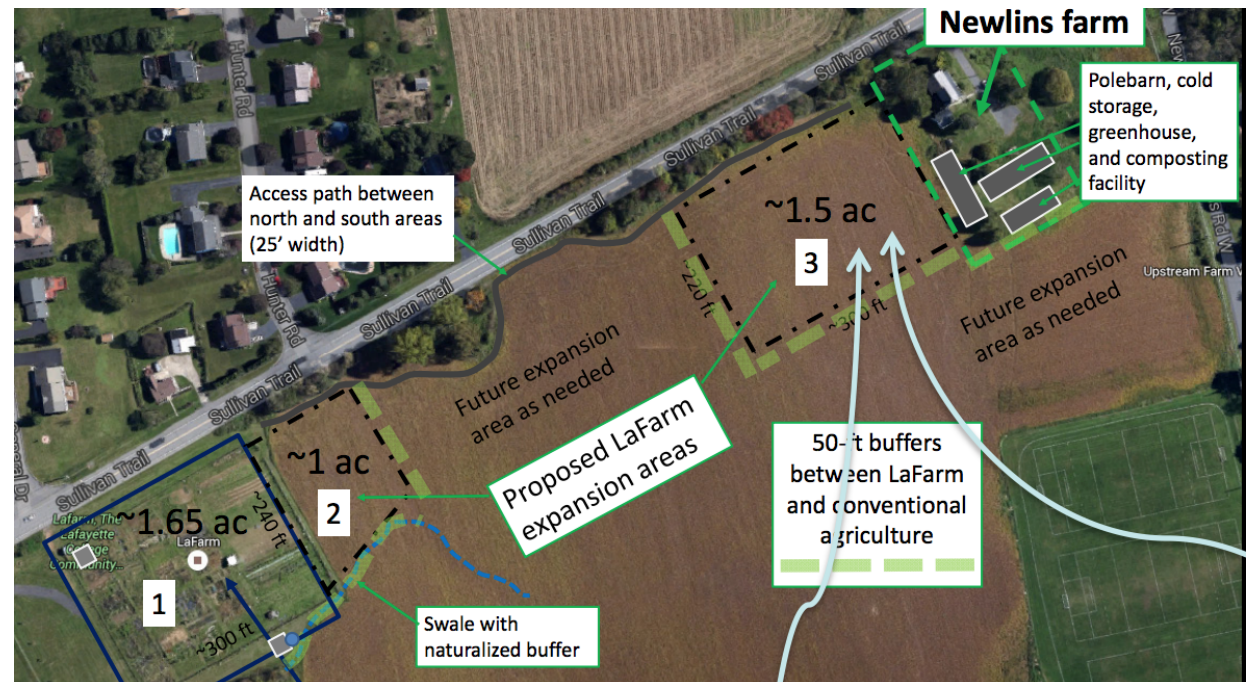
# The Greenhouse Initiative

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Jack Kleinert  
Jane Gibbons



# Brief LaFarm Background

- 2 acre working farm & community garden
- Over 37,000 ft<sup>2</sup> of production space
- Located at Metzgar, 3 miles north of Campus
- Managed by Sarah Edmonds, with the help of student orgs
- Incoming hoop house





# Why does LaFarm need a Greenhouse?



\*Current GH rental space at The Seed Farm

# Previous Capstone Reports

## Fall 2015

- “Analyze three standard greenhouse designs for how they would change LaFarm and enhance educational opportunities at Lafayette College, and define the processes for constructing them sustainably within that system”

## Fall 2016

- “Our goal is to integrate a carbon neutral power generation medium into the greenhouse that will be constructed on LaFarm and find a way to integrate LaFarm into the Lafayette/Forks/Easton Community”



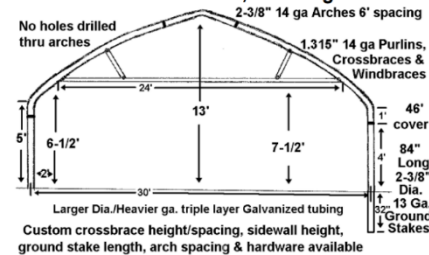
# Our Proposal

- 30'x96' gothic style greenhouse
- Based on recommendations from 2015 group

## NON-STOCK Greenhouse Frames

These frames feature 2 3/8" arches and 6' arch spacing. Contact us for pricing on custom frames or other lengths. In stock at our Midwest location, Charles City, IA. Allow 2-3 weeks for delivery. Prices are FOB Charles City, IA.

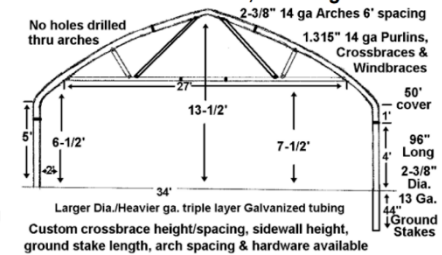
### 30' Gothic Greenhouse, 5' Straight Sides



This 30' frame includes crosstie assembly on each arch except end arches, and has 5 purlins and 4 wind braces. Hardware: cross connectors & pipe straps for fastening purlins, bolts & pipe straps for baseboard, end wall brackets, assembly instructions and stake driver.

Size	Price
30' x 48'	\$2,200.00
30' x 72'	\$3,250.00
30' x 96'	\$4,150.00

### 34' Gothic Greenhouse, 5' Straight Sides



This 34' frame includes crosstie assembly on each arch except end arches, and has 7 purlins and 4 wind braces. Hardware: cross connectors & pipe straps for fastening purlins, bolts & pipe straps for baseboard, end wall brackets, assembly instructions and stake driver.

Size	Price
34' x 72'	\$4,046.00
34' x 96'	\$5,236.00
34' x 144'	\$7,686.00

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Ephrata, PA 17522  
Phone: (717) 354-8376

## Aluminum Shutters

These aluminum shutters from J&D are designed to be used as an inlet, but may also be used for free-air exhaust. Nylon bushings, solid shafts, drawn cup-type sleeves on all movable linkages.

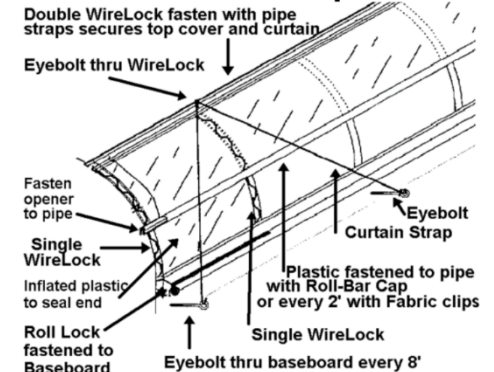


Item #	Description	Price
JAS16	16" Single Panel Shutter	\$48.00
JAS24	24" Single Panel Shutter	\$67.00
JAS30	30" Single Panel Shutter	\$91.00
JAS36	36" Double Panel Shutter	\$102.00
JAS40	40" Double Panel Shutter	\$129.00
JAS42	42" Double Panel Shutter	\$143.00
JAS48	48" Double Panel Shutter	\$164.00
JAS54	54" Double Panel Shutter	\$194.00
JAS60	60" Double Panel Shutter	\$250.00

For rough opening size for shutters: add 1/2" to shutter size (both dimensions).



## Greenhouse Roll Up Sides



Double WireLock & ZigZag Wire (see page 36.)

## 1.315" Galvanized Swedged Pipe, 17 ga.

For purlins or roll up pipe. 12' plus 3" swedge.

Item #	Description	Price	10+
GGP1312175	1.315" Purlin, 12' 3" length	\$10.40	\$10.00

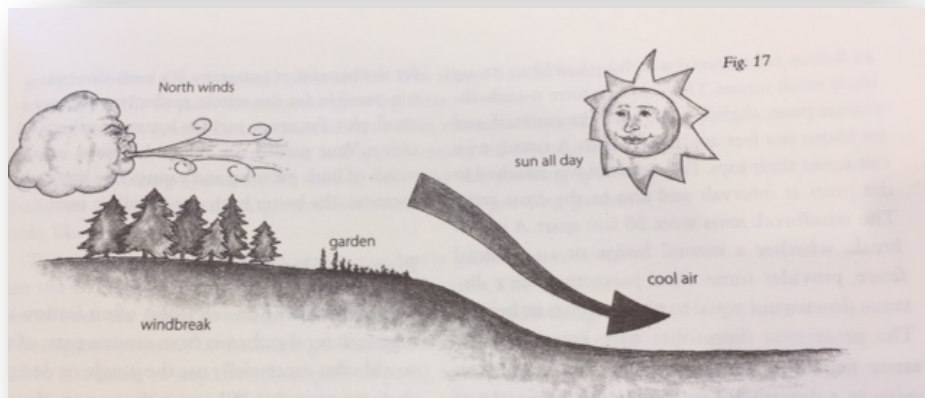
## Research Question

*"What steps need to be taken in order to design and build a greenhouse that suits the needs and contexts of LaFarm?"*



# STRUCTURE, LOCATION, INCLUDED SYSTEMS

# Proposed Location



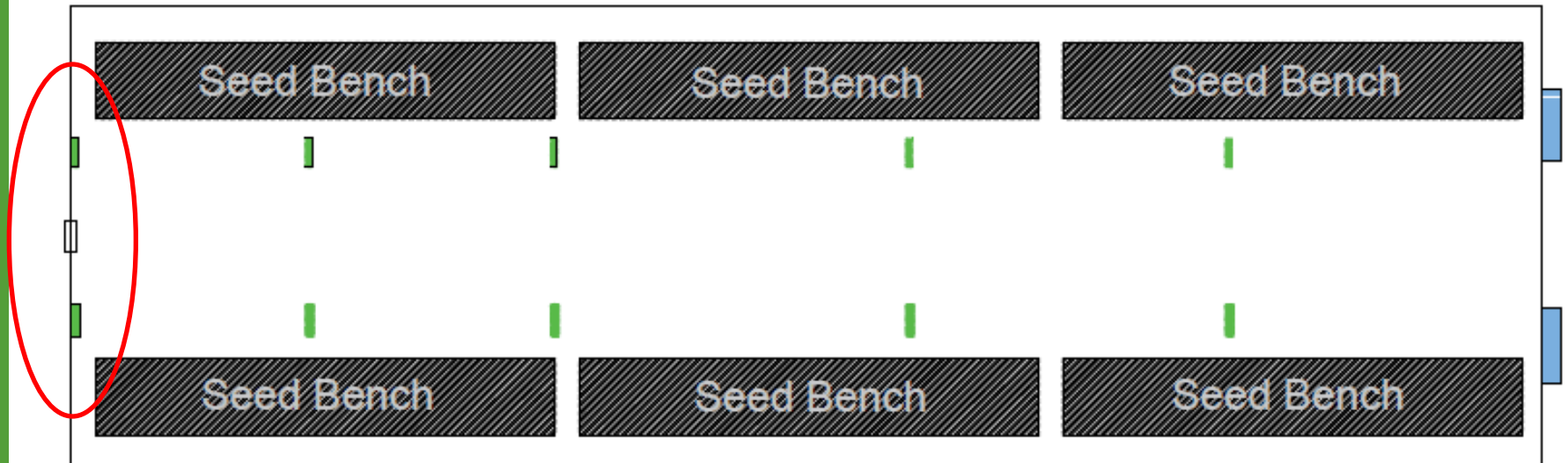


# Included Systems

- Irrigation
- Heating
  - Twice-Tempered
- Ventilation



# Greenhouse Footprint





# Cost Implications

Materials w/ classroom

~\$40,000

Construction

~\$5,000-\$10,000

O&M

~\$4,000/yr

Benefits

~time & money saved  
from less travel

Cost Estimate for 30" x 96" Gothic Greenhouse at LaFarm					
Item	Quantity	Unit Cost	Total Cost		
Greenhouse Frame	1	\$ 4,384.00	\$ 4,384.00		
5 1/2' Sidewall Add On	1	\$ 150.00	\$ 150.00		
Tufflite IV 48"x150"	1	\$ 576.00	\$ 576.00		
Aluminium Shutter 48"	2	\$ 164.00	\$ 328.00		
Exhaust Fans 50"	2	\$ 940.00	\$ 1,880.00		
12" Fans	8	\$ 77.00	\$ 616.00		
Heating Unit (135,00 BTU 3")	1	\$ 2,245.00	\$ 2,245.00		
Thermometers	30	\$ 4.40	\$ 132.00		
Therma Alarm	1	\$ 38.00	\$ 38.00		
Hoses	4	\$ 71.00	\$ 284.00		
Wonder Waterer	4	\$ 29.00	\$ 116.00		
Water Breaker Set	1	\$ 33.85	\$ 33.85		
Frost Proof Hydrant	1	\$ 88.00	\$ 88.00		
Fogger/ Misters	1152	\$ 1.00	\$ 1,152.00		
Benches (5" x 30")	6	\$ 969.00	\$ 5,814.00		
Roll Up Sides			\$ 1,164.88	*from 2015 capstone	
Field Office Classroom	1		\$ 20,000.00		
		Sub-Total	\$ 39,001.73		
Item	Quantity	Unit Cost	Total		
Level/ Grading (40 x 14 yd)*	560	\$ 2.35	\$ 1,487.08		
		Sub-Total	\$ 40,488.81		

\*performed break even analysis to estimate payback period  
~Roughly 8 years to offset initial costs

# Why Now? Is It Feasible?

- Small Farm Movement
- Peer Colleges
  - HaverFarm
- Commitments and Policies
- School Expansion
- Enhance Image



\*Haverford's Greenhouse

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# THANK YOU!

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Questions?