



# Packhouse Design and Use

Scott Thellman  
PFI - 2019

# About Me

- Owner of Juniper Hill Farms, LLC
- 2014 graduate of ISU
  - Agricultural Business
  - Agronomy
  - Agricultural Entrepreneurship
- Agricultural Entrepreneur
- Interests in post harvest handling, marketing, storage, and distribution of local and regional foods.





# Background

- Raised in Lawrence, Kansas.
- Moved with family to rural Douglas County, Kansas in 1999.
- Became interested in agriculture as a kid.
- Began working at different agricultural operations in my area as a teenager.
  - Sweet corn, vegetables, cattle, row crops



# Background

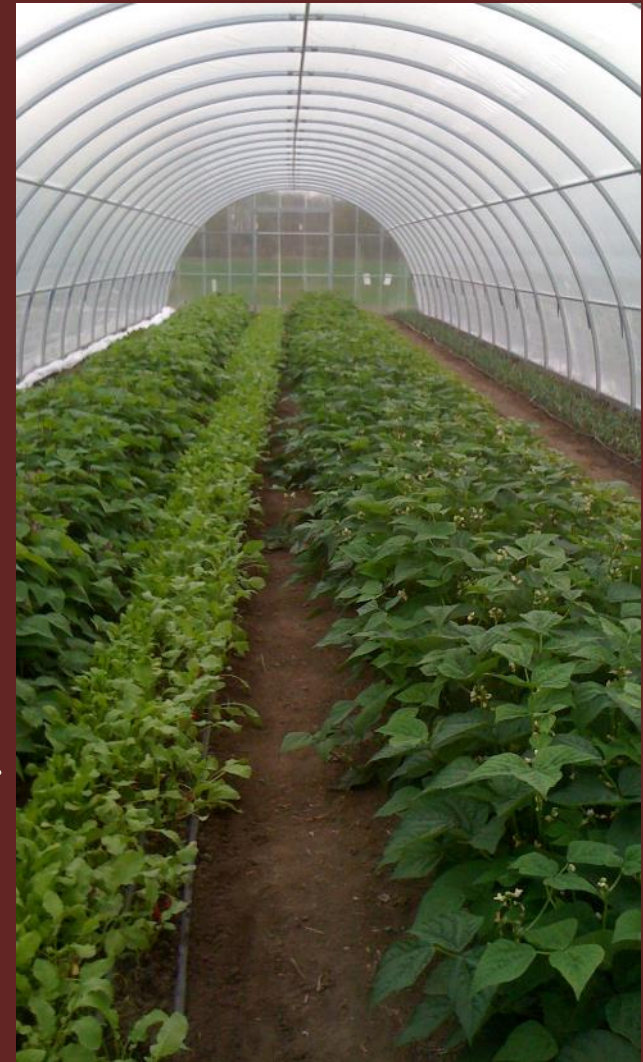
- Became interested in starting my own farm.
- Purchased some old hay equipment with savings from summer jobs.
- Baled 15 acres of hay in 2006, and sold it quickly.
- Saw my opportunity to enter into farming!





# Background

- Expanded hay operations throughout high school.
- Graduated high school in 2009, and produced 10,000 small square bales that summer.
- Entered into vegetable operations in 2010 with the construction of our first high tunnel.
- Started schooling at Iowa State in the fall of 2010.



# Background

- Constructed second high tunnel in 2011, and grew on one acre.
  - Primarily marketed crops at farmers market's.
- Expanded to two acres of vegetables in 2012, and focused on direct sale to grocers and restaurants.
- Partial USDA Organic Certification of farm in 2012.
- Increased hay production to 500 acres.





# Background

- Operation continued to expand slowly throughout college.
- Graduated Iowa State in 2014.
- Expanded to 4 Acres Organic vegetables in 2014.
- Hay acreage grew to 600 acres in 2014.
- After graduation from college, farm started rapid growth period.



# Today we...

- Produce over 1,500 acres of hay, alfalfa, small grains, and row crops.
  - 2,750 round bales and 3,000 square bales in 2018.
- Grow 50 acres of vegetables
  - 20 USDA Certified Organic, 30 Conventional in vegetable production.
  - Serving 21 grocery stores, 20 restaurants, 2 school districts, various wholesalers, and other markets.
- Provide agricultural consulting services, hay and vegetable brokering services, and custom hire services to over 75 customers around the region.



**2011**

**1/4  
Acre**

**2012**

**1 Acre**

**2013**

**2 Acres**

**2014**

**5 Acres**

**2015**

**18 Acres**

**2018**

**50 Acres**





# Crops We Grow

- Hay and Forage
- Small grains and row crops
- Hops
- 2018 Vegetables
  - Leaf Lettuce, Spinach, Kale, Chard, Beets, Potatoes, Watermelon, Pumpkins, Sweet Corn, Carrots, Cilantro, Basil, Napa Cabbage, Bok Choi, Winter Squash, Head Lettuce, Turnips, Radishes, and more!





How have we built and expanded  
our pack houses over the years  
to meet our needs.?



Get way over capacity, and then  
make the plunge and expand.



# First Year Harvests

- Year 1: Buckets, hoses, pickup beds, and refrigerators.
  - Way small scale
    - Very much a home garden scale.
- We knew this was not sustainable!
  - Knew if we were to get any bigger we could need more cold storage.





# The first step towards a real packhouse

– Converted a stall in our old horse barn into a 10x12' Cool-Bot cold storage room.

- Framed in room
- 2 x 2" foam board
- Plastic barriers
- FRP Panels
- Food grade light
- Insulated doors

– Total Cost: \$3,200



THIS COOLER WAS A  
GREAT AND CHEAP  
WAY TO GET STARTED.





# The first step towards a real packhouse

- Still did not have a washroom.
- Buckets, tables, truck beds.
  - We REALLY didn't know what we were doing.



# The First Packroom!

- 14x14 barn stall converted into a wash and pack room.
  - Triple sink
  - Good lighting
  - Washline
- The packroom was still small, but it was a huge step up in food safety and efficiency!







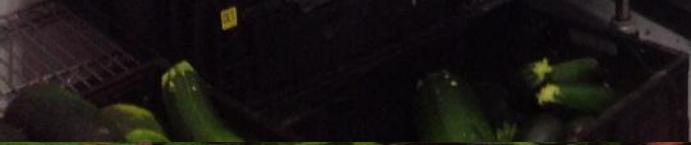
# Equipment













# Equipment

















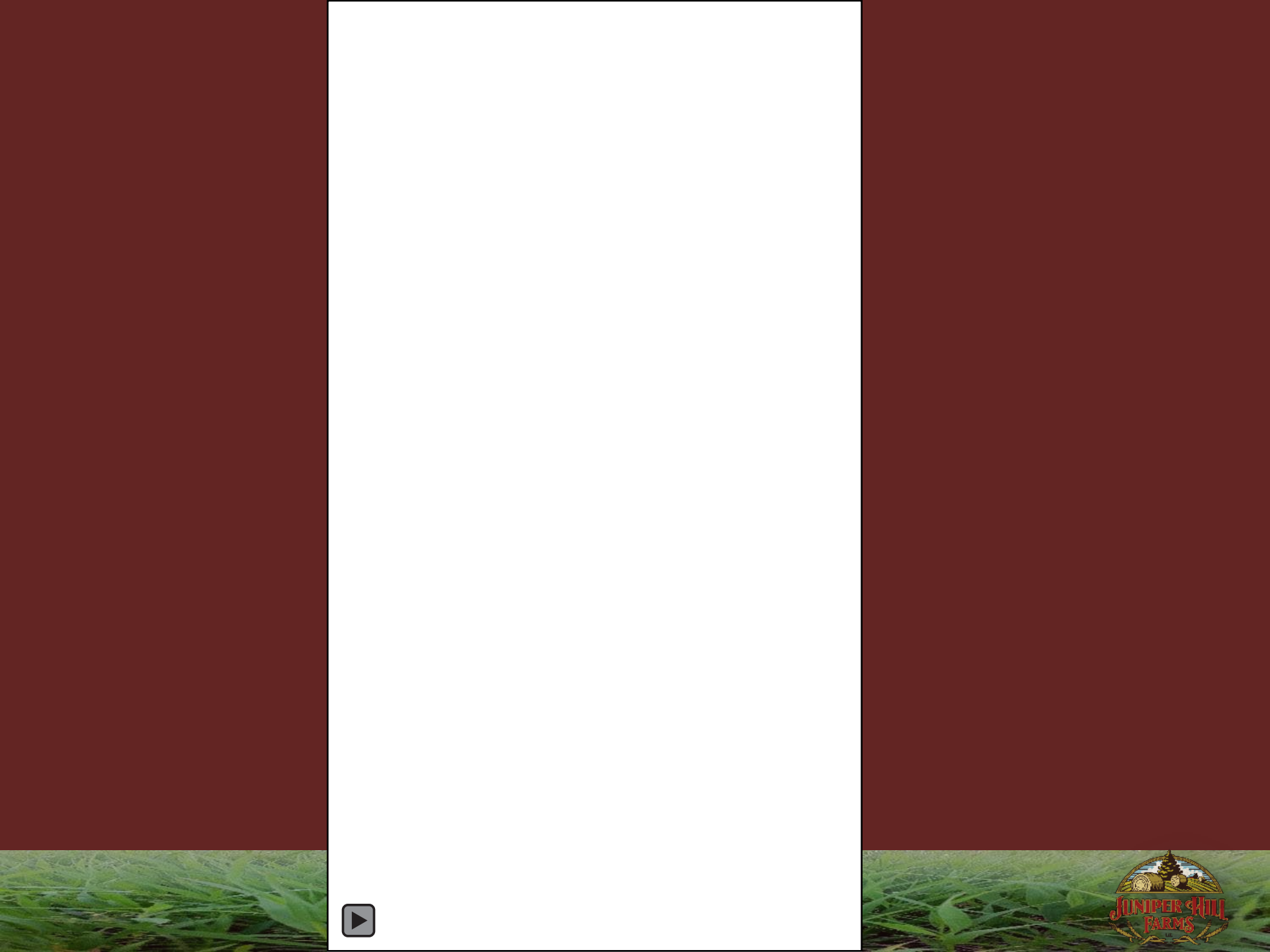






# Here comes the truck!



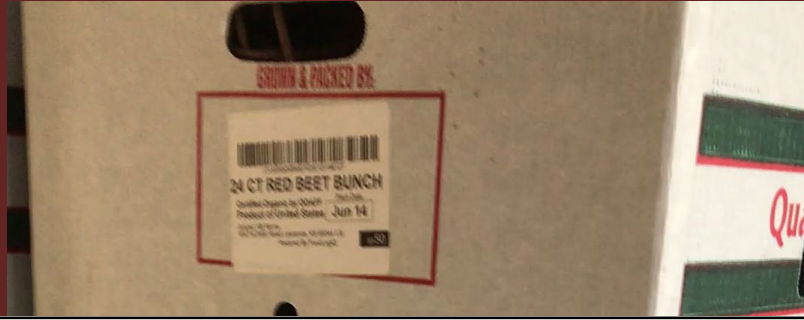


# Outgrowing a packhouse...

- In the washroom
  - It's awkward
  - You are trying to push more product through than you actually can.
    - Leads to longer hours for the crew, less efficiency, and lower quality product.





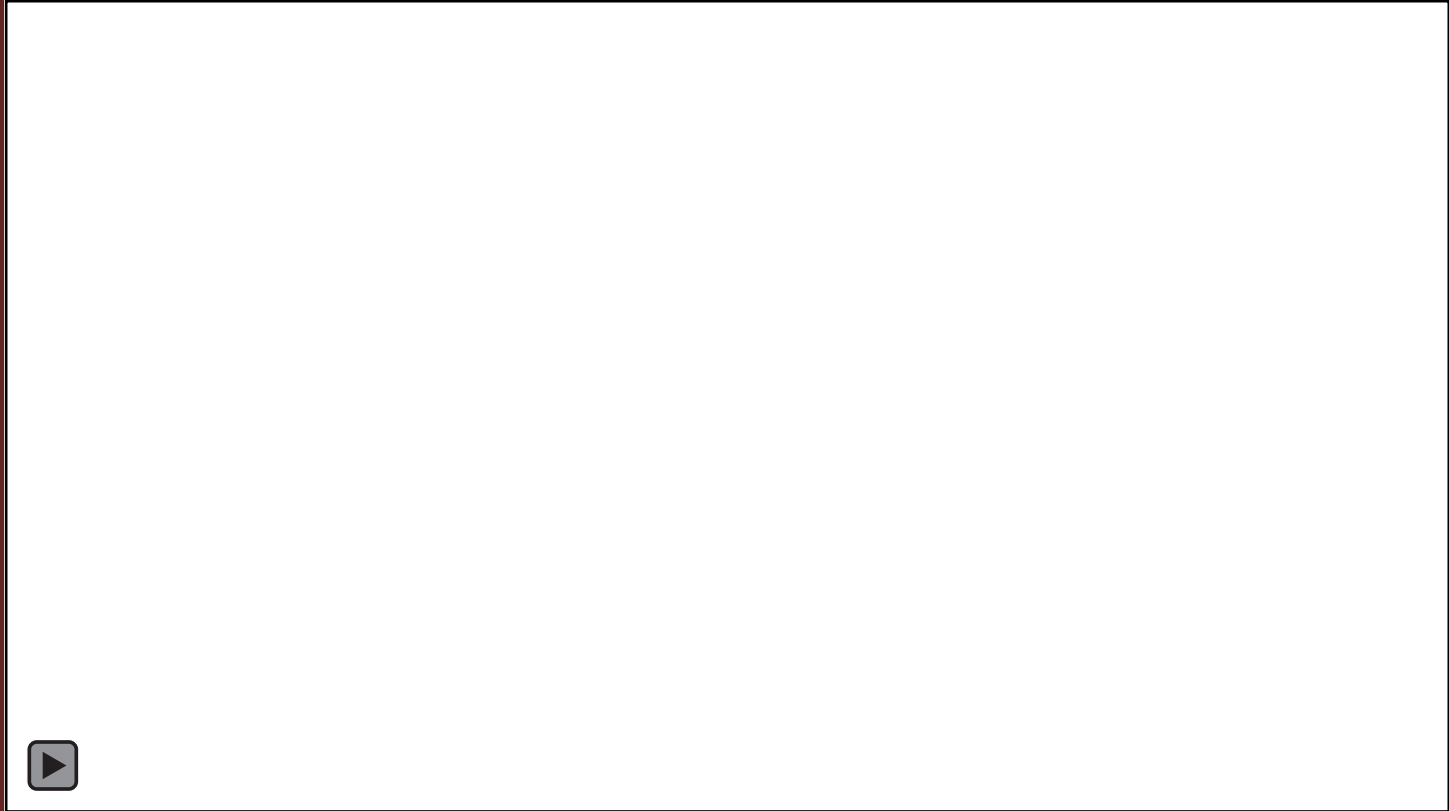


# Outgrowing a packhouse...

- In the cold storage
  - It is very awkward
    - Especially when growing CV and OG crops on the same farm.
    - We were utilizing as much space as we could
    - AC unit could not keep up...







# Time for an upgrade...

- Large buyer went out of business.
  - Bought assets form Colorado warehouse.
    - 5 semi loads
    - 1 Penske Truck
    - 1 Gooseneck trailer
    - 3 Amish growers
    - Right hand man
    - Bossman



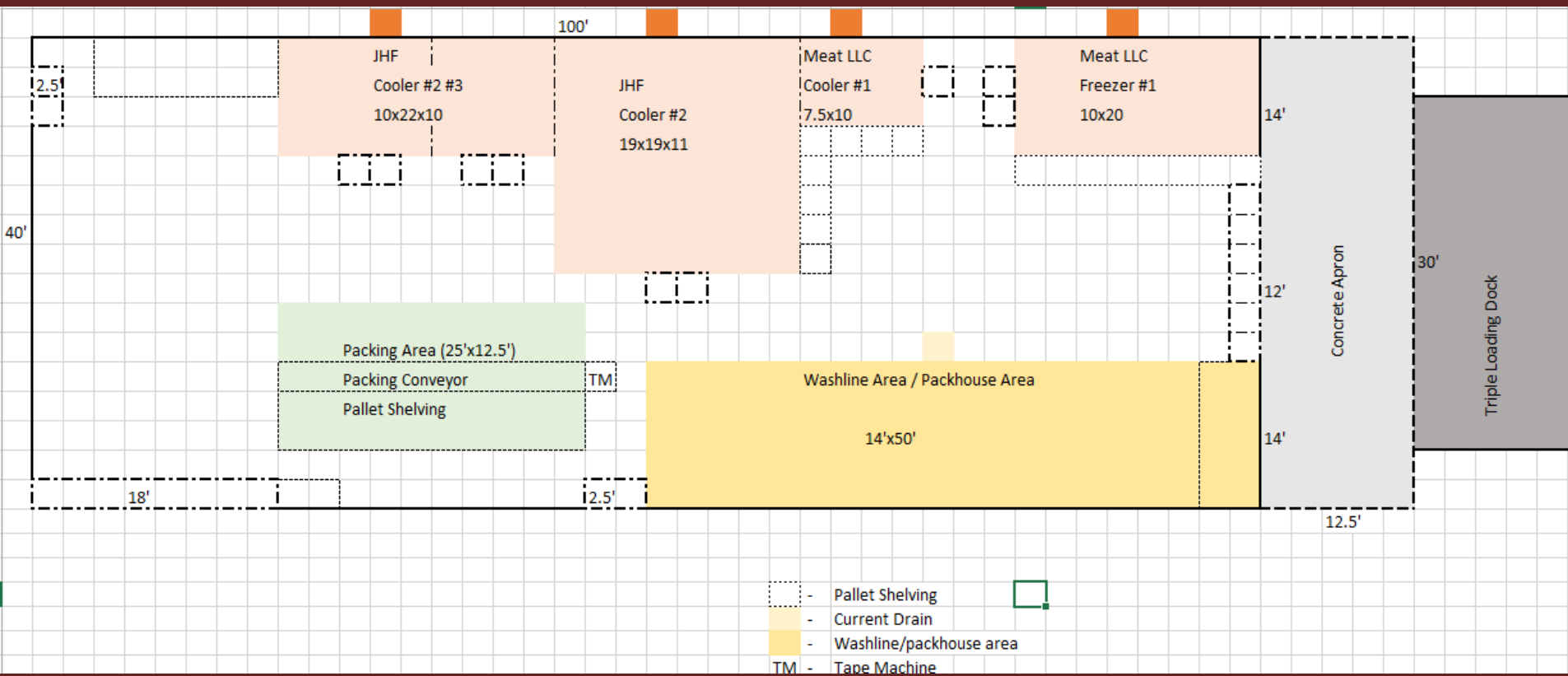




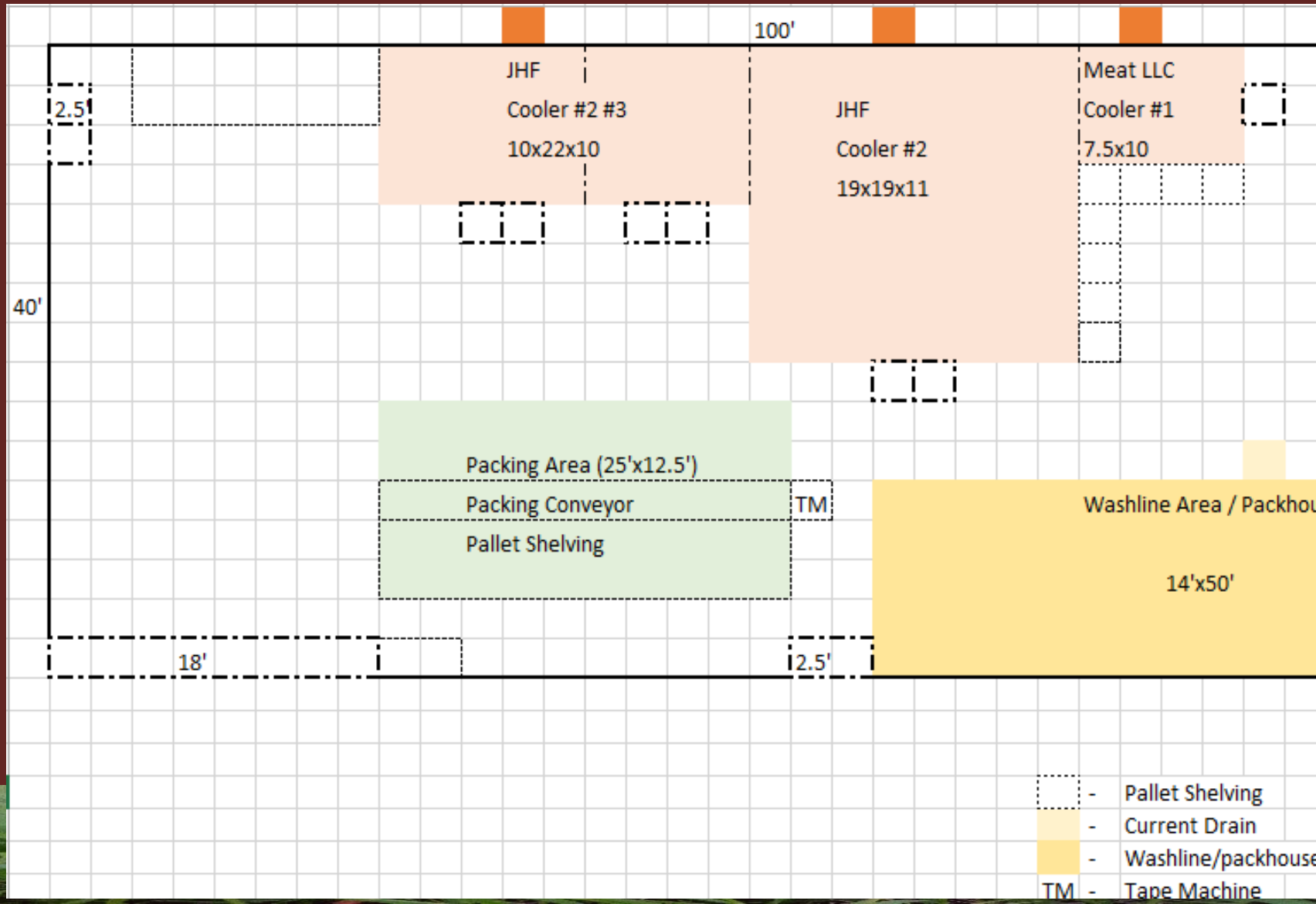




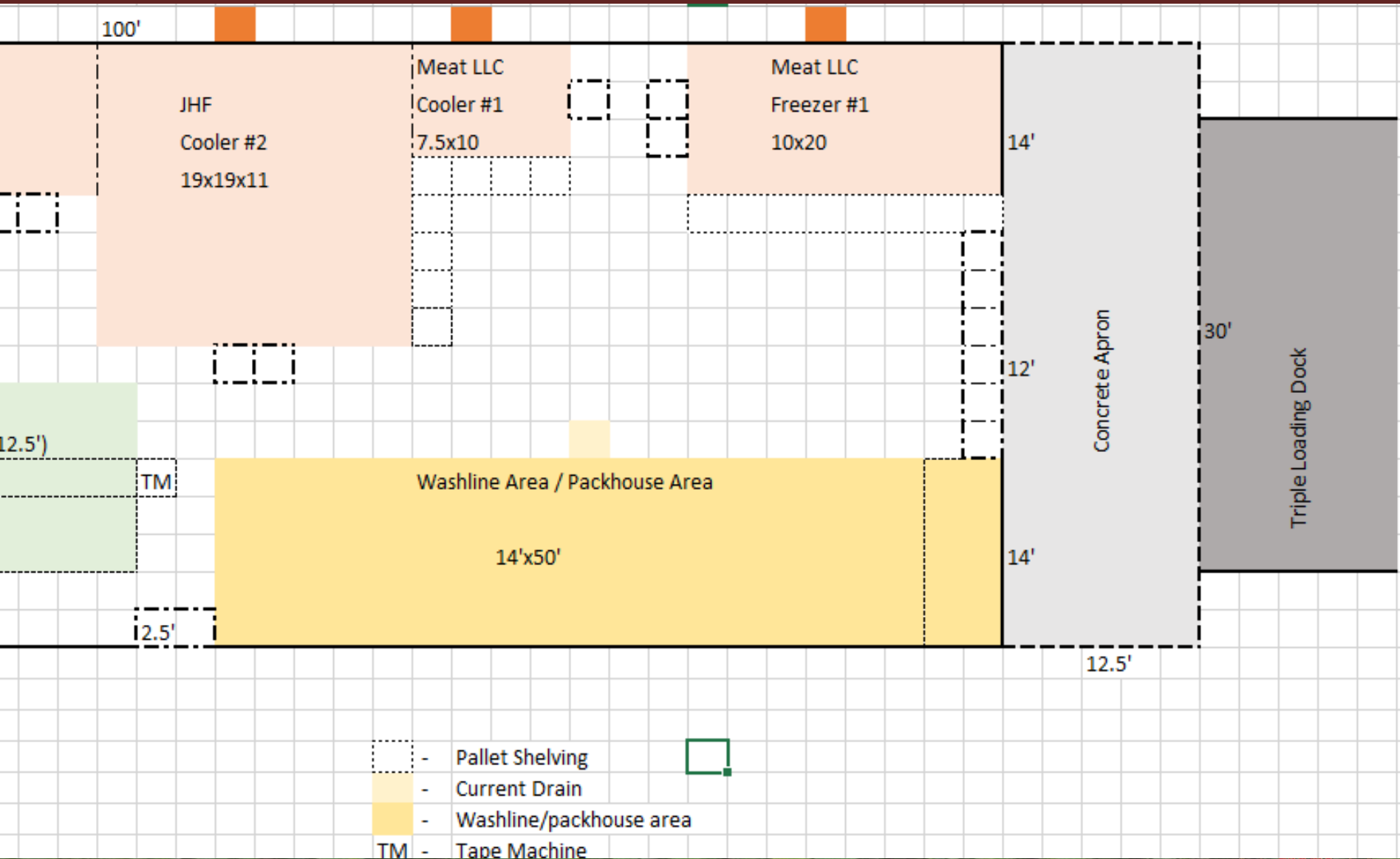
# New packhouse design



# New packhouse design



# New packhouse design







# The New Packhouse

- 4,000sqft
- 2 cooler units
- 1 freezer unit
- Triple sink
- Ice machine
- Washline
- Storage (for veg and supplies)
- Everything we thought we needed!





# The New Packhouse

- 4,000sqft
  - Use to be used for hay and equipment storage.
  - Value of good packhouse was more than hay and equipment storage.
  - Made sense, and kept it cheap.



# The New Packhouse

- 2 Coolers
  - 15x15
  - 10x15
  - Have two units for two different types of storage.
- 1 Freezer
  - 10x20
  - Rent to a meat distributor, and store organic grains.





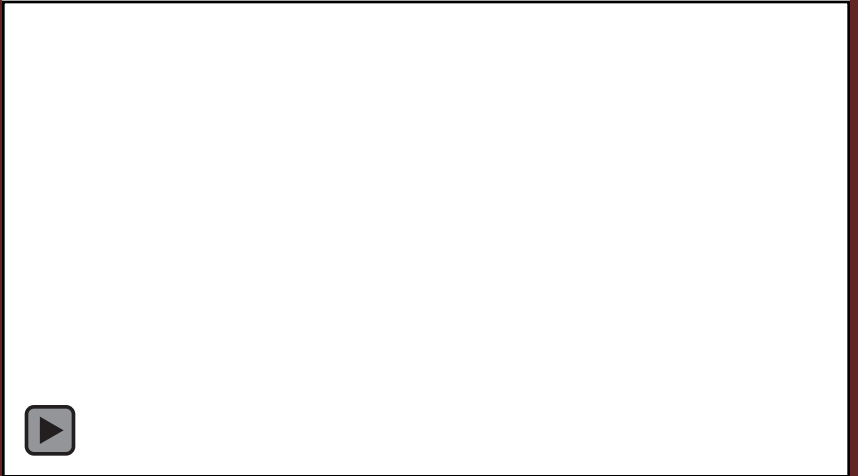
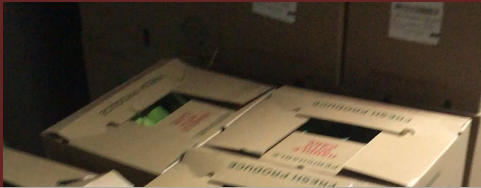
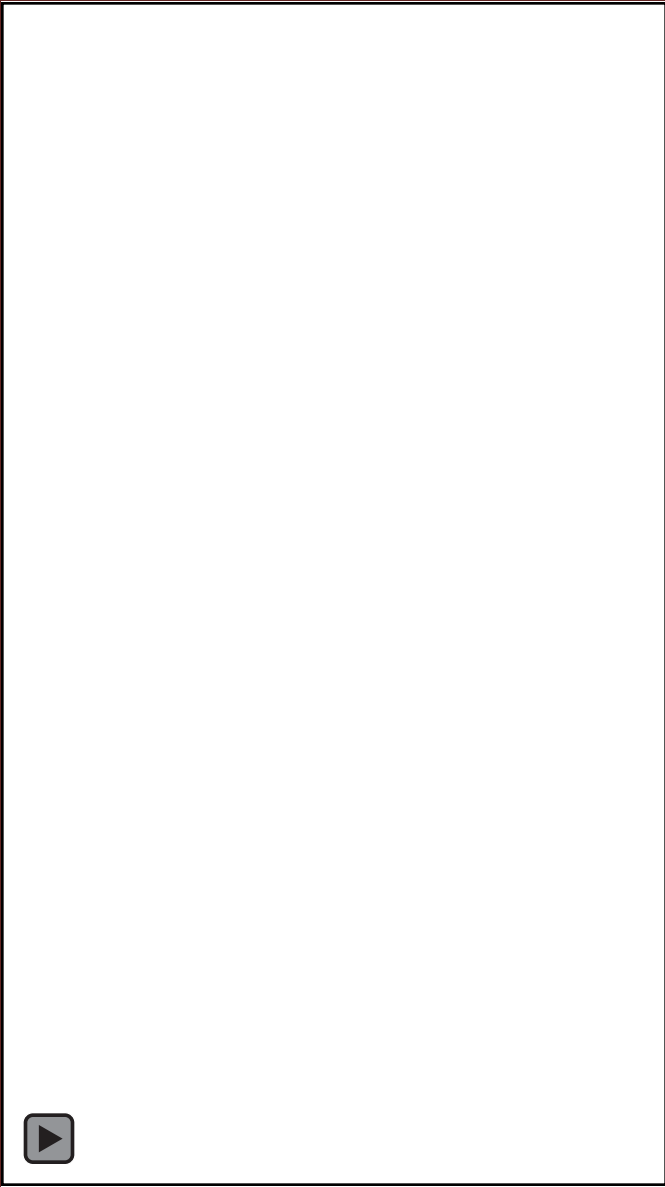












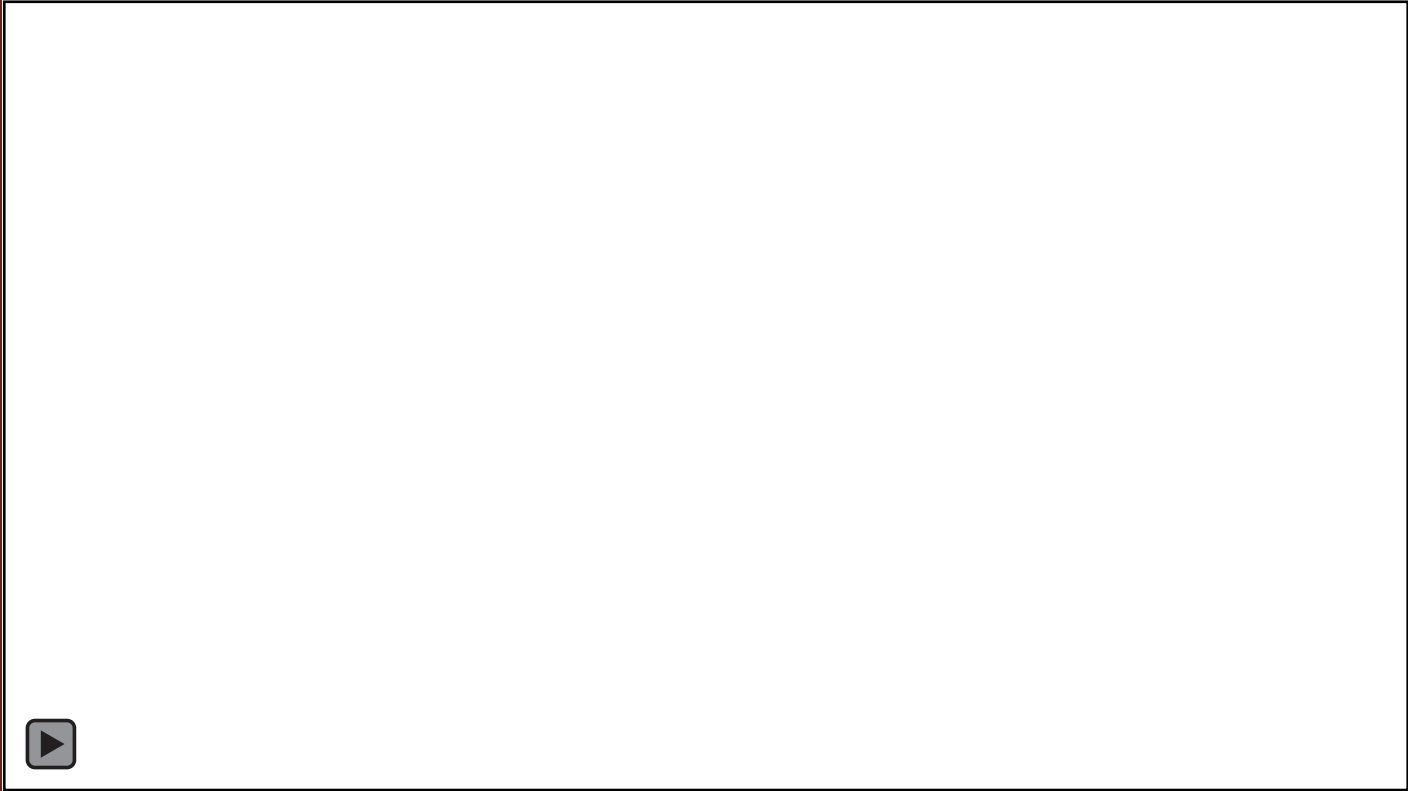
# The New Packhouse

- Triple Sink
  - One tank for sanitizer
  - Second for rinse
  - Third for rinse
- Lettuce Spinners
  - Lettuce goes from sink to spinners to cold storage.
- Ice Machine
  - Used for icing brassicas after harvest.









# The New Packhouse

- Washline
  - Same as what was in the barn, but with some added features.
- Storage
  - Everything in one place.









# Challenges

- Plumbing
  - Needed new drains
  - Everything had to be installed.
- Electricity
  - Three Phase
    - We only had single phase
    - Needed an inverter





# Things to think about

- What is your crop mix?
  - Lettuce, cold crops
  - Tomatoes, cukes, peppers
  - Apples
  - Winter Squash
- ALL OF THESE CROPS  
HAVE A DIFFERENT  
STORAGE  
CONDITIONS AND  
NEEDS.





# Things to think about

- What type of washing and sorting do you need?
  - High output
  - High intensity
  - No washing
  - Drying capability
- What you wash, and how you wash it play into the build out.



# Things to think about

- Packing area
  - Are you packing off the wash line?
  - Washing and bulk storing for later?
  - Do you have a CSA, and need to pack for that?
- All of these components play into a successful packhouse.



