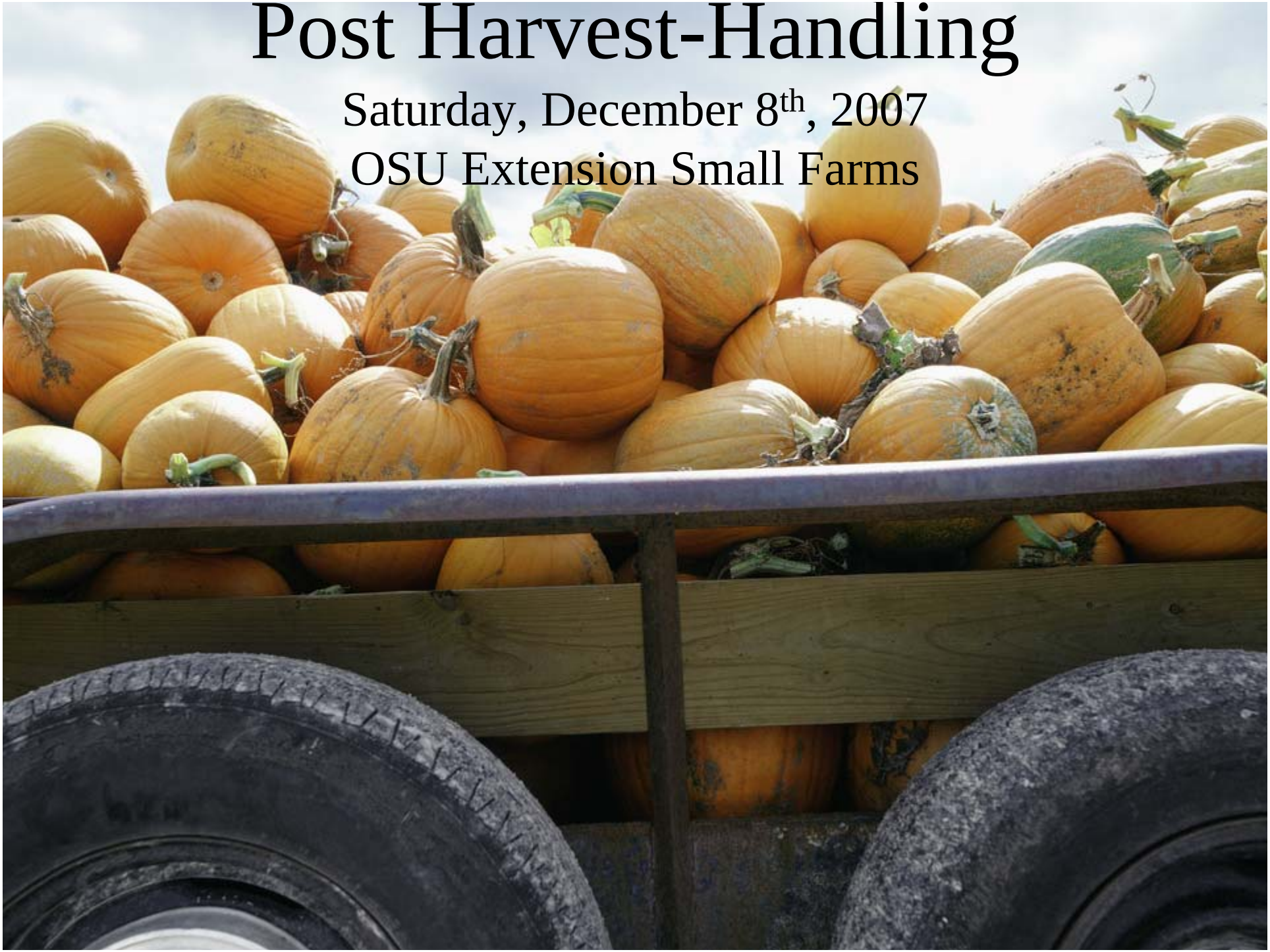
Post Harvest-Handling

Saturday, December 8th, 2007

OSU Extension Small Farms



Why is Post-Harvest Handling Important?

- Food Safety
- Increase shelf-life and marketing opportunities
- Final Step

Post Harvest Steps

1. Production Practices
2. Harvest Handling
3. Pre-cooling
4. Packaging
5. Sanitation
6. Refrigeration
7. Storage (for some crops)

1. Production Practices

- Choice of cultivars
- Environmental factors
- Management practices
- Food Safety

2. Harvest Handling

- Harvest during coolest time of the day
- Avoid unnecessary wounding or bruising
- Shade harvested produce in the field

Harvest Handling continued

- Use only clean transporting containers
- Handle as little as possible- field pack if possible
- Trim fingernails and/or wear gloves
- Begin post-harvest treatment as soon as possible
- Do not mix high quality produce with damaged produce
- Use appropriate harvest tools

Temperature- most important factor!

- Aging due to ripening and softening
- Respiratory heat production
- Moisture loss
- Spoilage due to bacteria, fungi and yeasts
- Undesirable growth

3. Pre-cooling

Most important for crops with high respiration rates

- Methods
  - Room cooling
  - Forced-air cooling
  - Hydro-cooling
  - Top or liquid icing
  - Vacuum cooling

Crop Respiration Rates

- High respiration
  - Artichokes
  - Cut flowers
  - Green onions
  - Snap beans
  - Asparagus
  - Broccoli
  - Peas
  - Corn
- Low respiration
  - Apples
  - Nuts
  - Grapes
  - Garlic
  - Onions
  - Potatoes
  - Sweet potatoes

4. Sanitation

- Pre-wash handling
- Water Disinfectant options
  - Chlorine (organic considerations)
  - Ozone
  - Hydrogen peroxide

5. Packing

- Boxes
- Flats
- Plastic Bags

6. Refrigeration

- Coolers
- Refrigerator
- Refrigerator truck
- Walk-in cooler
- Porta-cooler

Preventing Moisture Loss

- Monitor humidity with hygrometer
  - Spectrum Technologies 800-248-8873
  - Barr, Inc 920-231-1711
- Understand crop-by-crop humidity needs
- Humidification methods
  - Humidification device
  - Buckets of water
  - Keeping the floor wet

Chilling Injury

- Highly sensitive
  - Basil
  - Cucumbers
  - Eggplants
  - Pumpkins
  - Summer squash
  - Sweet potatoes
- Moderately sensitive
  - Snap beans
  - Musk melons
  - Peppers
  - Winter squash
  - Tomatoes
  - Watermelons

Ethylene

- Ethylene Producers
  - Apples
  - Apricots
  - Cantaloupes
  - Honeydew
  - Peaches
  - Pears
  - Plums
  - Tomatoes
- Ethylene-sensitive
  - Snap beans
  - Broccoli
  - Cabbage
  - Cucumbers
  - Eggplant
  - Lettuce
  - Peas
  - Potatoes

Lettuce

- 32 degrees
- 95% humidity
- Vacuum cooling or forced air cooling
- Sensitive to ethylene
- Sensitive to freezing
- Will store for two-three weeks

Broccoli

- 32 degrees
- 95-100% relative humidity
- Ice-cooling
- Will store for 2 weeks

Tomatoes

- 46-50 degrees
- 90-95% relative humidity
- Room cooling or forced air cooling
- Will store for 1 week

7. Storage Crops

- Season extension
- Home use
- Root cellars
- Coolers
- In-ground
- Curing

Cold and Moist

32-40 degreesF and 90-95% RH

- Carrots
- Beets
- Parsnips
- Rutabaga
- Turnips
- Celery
- Celeriac
- Salsify
- Leeks
- Collards
- Kohlrabi
- Broccoli (short-term)

Cold and Moist

32-40 degrees F and 80-90%RH

- Potatoes
- Cabbage
- Cauliflower
- Apples
- Grapes
- Pears
- Endive

Cool and Moist

40-50 degrees and 80-90% RH

- Cucumbers
- Sweet peppers
- Cantaloupe
- Watermelon
- Eggplant
- Ripe tomatoes

Cool and Dry

32-50 degrees F and 60-70% RH

- Garlic
- Onions
- Green soybeans

Moderately Warm and Dry

50-60 degrees F and 60-70% RH

- Dry hot peppers
- Pumpkins
- Winter squash
- Sweet potatoes
- Green tomatoes

Resources

- Peaceful Valley Farm Supply
- Grange
- *Quality Maintenance of Mixed Loads*
  - Ces.ncsc.edu/depts/hort/hil/post-index.html
- Kansas Sate University Publications
  - Oznet.ksu.edu/library
- Porta-cooler Design
  - attra.ncat.org/new_pubs/attra-pub/postharvest.html?id=Oregon