Activity 4 - Simple Postharvest Technologies

Improved Containers
- Kader
- Deo Datt Singh - India
- Brown & Wheeler - Cape Verde
- Stanley Masimbe - Rwanda

Improved Containers
- Plastic crates.
- Liners for existing rough packages.

Improved Packing
- Cantwell & Kitinoja
- John Kwaku Addo - Ghana
- Patrick Kumah & John-Eudes Bakang - Ghana
- Brown & Wheeler - Cape Verde
- Deo Dat Singh - India

Improved Packing
- Sorting by size and grade at packhouse
- Pickers sort into buckets
- Folding tables to bring work and product off floor.

Providing Shade
- SK Roy & Sunil Saran - India
- Brown & Wheeler - Cape Verde
- Stanley Masimbe - Rwanda
- Francis Appiah, Patrick Kumah & John-Eudes Bakang - Ghana
Providing Shade

Insect Control

- Mitcham & Bikoba
- Kerstin Hell, Guy Kodjogbe, Melchiade Mele & Leo Lamboni - Benin

Insect Control
1. CO₂ atmosphere kills many insects within 7 days

Mechanism of Utilizing Dry Ice To Generate CO₂ for Insect Control in Stored Grains, Dried Fruit and Nuts

1. Dry ice
2. Piston canister
3. Bucket
4. Flushed with CO₂

Insect Control
1. Store commodity in bags coated with insect repellent wax.
   a) Tests are underway at UC Davis
2. Hot water treatment to kill fruit flies in citrus to reduce losses during storage
   a) Investigating cost-effective strategies that can provide uniform temperatures to reduce potential for fruit damage
**Insect repellent bag with leafroller larvae**

**Storage bags**
- Fresh n'Smart bags to keep produce fresh and prolong shelf life
  - Slightly modified atmosphere (CO₂, O₂, RH)
  - Very high oxygen transmission rate
  - Maintain high humidity around the products
  - May work with good or moderate temperature management
  - Tests of efficacy are underway

**Low Energy Cold Storage**
- Thompson, Kitinoja, Reid
- SK Roy - India
- Melchiade Mele - Benin
- Stanley Masimbe - Rwanda

**Relative Perishability of African Produce**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Producers</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 week</td>
<td>Leafy crops - African Eggplant, nightshade, Ethiopian mustard, kale, Amaranth, onion, cabbage, cowpea</td>
<td></td>
</tr>
<tr>
<td>0°C</td>
<td>French beans, okra</td>
<td>Pineapple, oranges</td>
</tr>
<tr>
<td>7 to 10°C</td>
<td>French beans, okra</td>
<td>Pineapple, oranges</td>
</tr>
<tr>
<td>12 to 15°C</td>
<td>Tomato, banana, plantain, mango</td>
<td>Sweet potato, pumpkin</td>
</tr>
</tbody>
</table>

**Evaporatively Cooled Chamber**
- Ghana, India

**Clay Refrigerator**
- Ghana, India
**Small-scale Cool Transport**

- Kitinoja, Thompson, Reid

**Small-Scale Cool Transport**

- Cool and ship in an insulated box

**Cool & Ship**

- Thompson & Reid
- Brown - Cape Verde

**Cool & Ship**

- Cool with air conditioner & Coolbot and ship in an insulated box

**Cold Room with CoolBot**

**Slow Fruit Ripening**

- Reid & Mitcham
- Kerstin Hell & Guy Kodjobe - Benin
- Stanley Masimbe - Rwanda
Slow Fruit Ripening

• 1-MCP
• Ethylene scrubbers
• Delay flowering

Low-Cost Food Processing

• Barrett & Thompson
• Bertha Mjawa - Tanzania
• SK Roy, Sunil Saran, S. C. Jain - India
• Majendra Thapa - Nepal
• Kerstin Hell - Benin

Low-cost Food Processing

• Solar cookers
• Combined methods for processing fruits
  – Blanching
  – Acidification
  – Lower $a_w$
  – Antimicrobials

Solar Drying

Future Project Activity

• Water Disinfection & Sanitation.
• Curing.
• Peltier refrigerator.
• Production issues that assist postharvest.