

## Cost/Benefit examples from CCARD Workshop (September 2002)

### C/B exercises:

1. Form into small groups with respect to crop of interest
2. Select a postharvest technology of interest
3. Discuss costs of current practices versus cost of the new practice (ignore any costs that will remain the same, such as production, marketing, etc)
4. Discuss expected benefits, estimate a value for each benefit
5. Fill out worksheets, calculate relative costs and benefits
6. For longer term investments, calculate ROI (Return on investment, in terms of the time it takes to pay for the investment)

# COST BENEFIT WORKSHEET

Assume harvest 1000 kg

|                          | Current Practice | New Practice |
|--------------------------|------------------|--------------|
| Describe:                |                  |              |
| <b>COSTS</b>             |                  |              |
|                          |                  |              |
|                          |                  |              |
|                          |                  |              |
|                          |                  |              |
|                          |                  |              |
| Relative cost            |                  |              |
|                          |                  |              |
| <b>EXPECTED BENEFITS</b> |                  |              |
| % losses                 |                  |              |
|                          |                  |              |
| Amount for sale          |                  |              |
|                          |                  |              |
| Value/kg                 |                  |              |
|                          |                  |              |
| Total market value       |                  |              |
| Value - costs            |                  |              |
| Relative profit          |                  |              |

Results of C/B exercises in Ghana (Sept 2002)

Group 1: Pineapple

## COST BENEFIT WORKSHEET

Assume harvest 1000 kg

|  | Current Practice | New Practice |
|--|------------------|--------------|
|--|------------------|--------------|

Group 2: papaya (Sunripe)

Group 3: Yams

## COST BENEFIT WORKSHEET

Assume harvest 1000 kg

|                          | Current Practice | New Practice          |
|--------------------------|------------------|-----------------------|
| <b>Describe:</b>         | No curing        | Curing before packing |
| <b>COSTS</b>             |                  |                       |
| \$0.05/kg for curing     |                  | \$50                  |
|                          |                  |                       |
|                          |                  |                       |
| Relative cost            |                  | +\$50                 |
|                          |                  |                       |
| <b>EXPECTED BENEFITS</b> |                  |                       |
| % losses                 | 10%              | 2%                    |
|                          |                  |                       |
| Amount for sale          | 900 kg           | 980 kg                |
|                          |                  |                       |
| Value/kg                 | \$0.68/kg        | \$0.80/kg             |
|                          |                  |                       |
| Total market value       | \$612            | \$784                 |
| Value - costs            | \$612            | \$734                 |
| Relative profit          |                  | +\$122                |

Group 4: Okra

## COST BENEFIT WORKSHEET

Assume harvest 1000 kg

|  | Current Practice | New Practice |
|--|------------------|--------------|
|--|------------------|--------------|

Describe:

Group 5: Chillies

## COST BENEFIT WORKSHEET

Assume harvest 1000 kg

## MORE Cost and Benefit Examples

### **COMPARISON OF ESTIMATED COSTS AND EXPECTED BENEFITS OF USING PLASTIC CRATES TO HANDLE HORTICULTURAL PRODUCE**

#### Costs:

Containers  
Materials (liners, trays)  
Trained labor  
Crate cleaning and repair

#### Benefits:

Reduced losses due to less crushing and lower produce damage, water loss and weight loss  
Higher value paid for higher quality packaged produce

Example: **Plastic reusable containers with disposable cardboard liners** are used for transport and display during direct marketing. You have reduced postharvest losses due to lower rate of compression damage (fewer failed packages) compared to typical losses of 10%. If you handle 1000 lbs of produce at an average value of \$0.95 per lb, you will have 50 additional lbs of produce to market if the crates reduce postharvest losses to 5%.

#### Costs:



Example:

Unsorted chili peppers packed in 50 lb sacks have a value of \$0.20/lb. At a given time, 1000 lbs are packed and marketed to commercial buyers, who must sort the peppers before resale to consumers or for food service use with average postharvest losses due to decay of 15%. Sorted produce will have additional marketing options.

Costs:

Example: Two tons of mangoes harvested at the peak of the season (June 15 to 20) are handled either at ambient temperatures (30 to 35 °C) or via an integrated cold chain (15 °C) where cooling costs are relatively high: \$1000 (\$0.25 / lb).

|                         | Ambient temperature                     | Cold Chain                              |
|-------------------------|---|---|
| Postharvest losses      | 35%                                     | 10%                                     |
| Quality classes:        | 20% highest<br>50% second<br>30% lowest | 50% highest<br>30% second<br>20% lowest |
| Total volume sold       | 2600 lbs                                | 3600 lbs                                |
| Marketing period        | June 15-June 28                         | June 15 - August 1                      |
| Average price/lb        | \$0.50                                  | \$1.25                                  |
| Sales - cost of cooling | \$1300                                  | \$3500                                  |

### **COSTS AND BENEFITS OF USING ICE FOR COOLING DURING TRANSPORT TO MARKET.**

Costs: Ice, Reduced amount of produce per load (all other expenses are assumed to be the same)

Benefits:

Reduced water loss

Reduced decay rates

Higher quality during marketing

Longer shelf life

|  | with ice            | no cooling       |
|--|---------------------|------------------|
| 1/2 ton pick-up load of mixed lettuces | 750 lbs             | 1000 lbs         |
| cartons @ \$2.50 each (20 lbs/carton)  | 38 cartons = \$95   | 50 cartons=\$125 |
| ice (\$0.50/10 lbs)     \$0.05/lb      | 250 lbs = \$12.50   | 0                |
| water loss/decay rate                  | 5%                  | 10%              |
| losses                                 | (37.50 lbs)         | (100 lbs)        |
| Produce available to sell              | 712.5 lbs           | 900 lbs          |
| Quality grades                         | highest (\$1.19/lb) | 60%=( \$535)     |
|  | second (\$0.69/lb)  | 30%=( \$186)     |
|  | lowest (\$0.25/lb)  | 20% =( \$45)     |
|  | 90% = \$742         |                  |
|  | 10% = (\$49)        |                  |
|  | 0%                  |                  |

|                              |           |         |
|------------------------------|-----------|---------|
| Market value                 | \$812     | \$766   |
| Costs containers             | (\$95)    | (\$125) |
| ice                          | (\$12.50) | 0       |
| Potential net sales per load | \$704.50  | \$641   |

## COSTS AND BENEFITS OF POSTHARVEST IPM PRACTICES

Costs:  
materials  
labor  
power

Benefits:  
reduced decay rates or insect losses  
longer shelf life  
improved quality

Harvest 1000 lbs of green beans, sort, cool and pack beans for marketing in California within one week. Postharvest IPM in this case involves a quick hot water dip (followed by an ice bath) to reduce disease problems during storage and marketing.

|  | Minimal pest controls | Postharvest IPM    |
|--|-----------------------|--------------------|
| labor for harvest (5 hours at \$7.50/hr)   | \$35                  | \$35               |
| labor for sorting/grading                  | \$12                  | \$12               |
| hot water treatment (0.5 minutes at 52 °C) |                       | \$10               |
| ice bath                                   |                       | \$10               |
| postharvest losses                         | 20%                   | 5 %                |
| amount available to market                 | 800 lbs               | 950 lbs            |
| market value                               | \$0.50/lb<br>\$400    | \$0.79/lb<br>\$750 |

COMPARISON OF ESTIMATED COSTS AND EXPECTED BENEFITS RELATED TO  
TRADITIONAL PACKHOUSE OPERATIONS OR FIELD PACKING FRESH PRODUCE.

Costs:

Equipment (carts, mobile packing stations or wagons equipped with shade)

Trained Labor