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### Contact Information for Mechanical Harvester Contractors

#### ***Trunk Shake and Catch System***

Coe-Collier Citrus Harvesting, LLP, Will Elliott  
1320 N. 15th Street, Immokalee, FL 34142  
(239) 658-6074, coecollier@aol.com

#### ***Canopy Shake System***

Everglades Harvesting & Hauling, Inc. (CCSC), Paul J. Meador  
1331 Commerce Drive, LaBelle, FL 33935  
(863) 675-8500, ehhinc@aol.com

T&S Harvesting (CCSC), Tom Visser  
PO Box 669, Felda, FL 33930  
(863) 675-4046

Mutual Harvesting Co. (T-CS), Carson Futch  
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# Evaluating Citrus Mechanical Harvesting Systems



## Objectives of Mechanical Harvesting

- » *Decrease harvesting costs*
- » *Increase "on-tree" revenue*
- » *Increase overall labor productivity*
- » *Reduce the number of needed harvest workers*

## 2004-2005 Commercially Available Machines

### ***Trunk-Shake-Catch (TSC)***



A TSC set includes three machines--a shaker, a receiver, and a field truck (goat). Trunks are shaken between 5 and 10 seconds to remove fruit. Trees have to be "skirted" to allow shaker and receiving units to position underneath the tree canopy. Fruit is caught and conveyed to a cart holding up to 90 boxes of fruit.

### ***Continuous Canopy Shake & Catch (CCSC)***



One CCSC set includes a minimum of four machines--two harvesting units and two field trucks. Working in parallel, a CCSC system travels between 1 and 2 mph down each side of the tree row. Shaker heads penetrate the canopy to remove fruit. Caught fruit is conveyed to a trailing field truck. CCSC system is well suited for long rows and uniform sized trees. Trees have to be "skirted" to allow optimal fruit collection.

### ***Tractor Drawn Canopy Shake (T-CS)***



T-CS uses a harvesting mechanism similar to the CCSC. T-CS harvests fruit from one side of the tree canopy at a time, dropping fruit to the ground. A hand crew picks up ground fruit and gleans remaining fruit in the tree. Suited for older, non-uniform trees. Skirting is recommended but not necessary.

## Machine Performance Statistics

Average values collected from the 2000-2004 seasons.

		TSC		CCSC		T-CS	
		Ham lin	Valencia	Ham lin	Valencia	Ham lin	Valencia
<b>Avg. Yield</b>	<b>Bx/acre</b>	554	371	460	375	377	312
<b>Removal</b>	<b>%</b>	95%	95%	95%	95%	91%	90%
<b>Recovery</b>	<b>%</b>	87%	88%	90%	90%	99%	99%
<b>Harvest Speed</b>	<b>Tree/hr</b>	190	229	361	466	184	298
<b>Labor Productivity</b>	<b>Bx/man-hr</b>	96	76	103	122	16	20

The data above represents systems used in a variety of grove conditions **without** abscission chemicals.

### **Calculating the Adoption Decision**

#### **Grower Benefits (\$/Acre)**

- » Difference between hand and mechanical harvesting price
- » Recovery % (with or without gleaning services)
- » Yield (bx/acre)

#### **Grower Costs (\$/Acre)**

- » Value of non-harvested fruit/delivered-in price
- » Annual skirting
- » Cost of grove/tree preparation

**If Benefits > Cost,  
Consider Mechanical Harvesting**

Website for spreadsheet model available at the University of Florida, Southwest Florida Research & Education Center's website:  
<http://www.imok.ufl.edu/economics>