

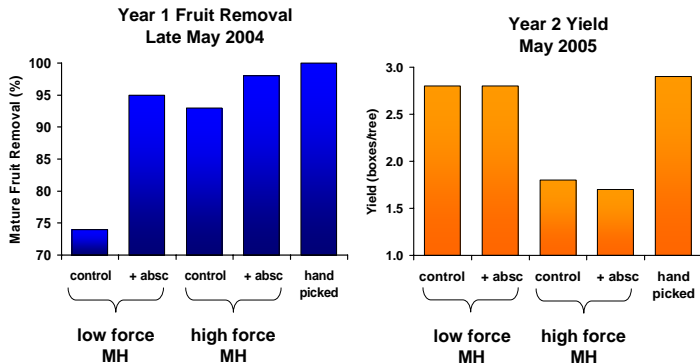
Evaluating The Use of Abscission Agents With Mechanical Harvesting Systems

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The cost of harvesting now exceeds the total cost of production. This fact has focused industry attention on mechanical harvesting technologies that can reduce costs associated with harvesting. Since 1994, a vigorous harvesting research and development program was initiated and administered by the Florida Department of Citrus to facilitate the development of mechanical harvesting technologies for the purpose of reducing grower costs. Many factors affect performance of these mechanical harvesters, however fruit removal can be improved with **abscission compounds**.

Abscission and Mechanical Harvesting for Florida



Late Season Mechanical Harvesting a Reality

With abscission, low-force mechanical harvesting (MH) can achieve high fruit removal percentages. Next year's crop is not impacted because low-force harvesting removes low amounts of green fruit.

Mechanical Harvesting Capacity Increases

Abscission will allow mechanical harvesters to achieve high fruit removal percentages in less time because mature fruit are easier to remove. Increased capacity means more fruit can be harvested in a day, a month or in a season.

	Trunk Shaker % Removal		Continuous Canopy Shaker % Removal		
	2 sec	7 sec	1 mph	1.5 mph	2 mph
Control	85	96	92	87	83
Abscission	96	97	97	97	96

Trees treated with abscission

- Have the same yield as non-treated trees
- Do not have unwanted leaf, flower or green fruit drop
- Have fruit with the same juice quality as those from non-treated trees
- Are harvested in 3 to 5 days after application
- Can be harvested less aggressively with less physical damage



Abscission-treated fruit



Peel injury is only cosmetic



Stems easily removed from fruit

Projected Benefits of Abscission to the Citrus Industry

Prepared by Fritz Roka, University of Florida - IFAS, Revised September 2005

Evaluating Potential benefits of Abscission in Mechanical Harvesting

Ownership and operational rates

	Current situation NO Abscission	5% increase recovery % w/ abscission	10% increase speed w/ abscission	4 wk season extension w/ abscission	2 hr daily extension w/ abscission	Increase recovery (5%), speed (10%), & season (2 hr * 4 wk) w/ abscission
1 Seasonal Revenue Goal \$/yr	\$500,000	\$500,000	\$500,000	\$518,000	\$539,000	\$539,000
Hrs/day	6	6	6	6	8	8
Days/week	6	6	6	6	6	6
Weeks/season	22	22	22	26	26	26
2 Hrs "active" harvest hrs/yr	792	792	792	936	1,248	1,248
Avg hourly rate:	\$631	\$631	\$631	\$553	\$432	\$432

Grove conditions

in-row spacing (ft)	12
cross-row spacing (ft)	24
Trees/ac	151
Bx/tree	3
Yield (bx/ac)	454

Assumptions: added labor costs for extended harvest

extra hr rate:	\$125/hr	\$125/hr
extra hrs	144	312
extra cost	\$18,000	\$39,000

Harvesting performance

	Current situation NO Abscission	5% increase recovery % w/ abscission	10% increase speed w/ abscission	4 wk season extension w/ abscission	2 hr daily extension w/ abscission	Increase recovery (5%), speed (10%), & season (2 hr * 4 wk) w/ abscission
harvest speed tree/hr	300	300	330	300	300	330
runtime %	70%	70%	70%	70%	70%	70%
(net) recovery %	90%	95%	90%	90%	90%	95%
Harvest capacity bx/hr	566	598	624	566	566	658
Harvest Price (NO gleaning) \$/bx	\$1.11	\$1.06	\$1.01	\$0.98	\$0.76	\$0.66

Potential benefits from abscission:

Harvested acreage	100,000	95%	90%	90%	90%	95%
Yield per acre	454					
Anticipated cost of abscission	\$50-70/Acre (including materials and application)					
Boxes harvested	43,106,250	43,106,250	40,837,500	40,837,500	40,837,500	43,106,250
Total Dollars saved		\$2,529,123	\$4,188,227	\$5,616,987	\$14,380,396	\$19,774,749
Dollars per acre saved		\$25	\$42	\$56	\$144	\$198

1. Revenue goal suggested by commercial harvesters.
 2. Yellow highlights represent calculated values from given information/assumptions

Steps Leading to Registration of Our Abscission Compound

