

A Review of Continuously Moving Harvesters for Cherry

1. USDA Peterson Berry Harvester Prototype (BTR)
2. Grant's Cherry Harvester Prototype (BTR)
3. Oxbo Commercial Citrus Harvester (BTR)
4. Korvan Commercial Blueberry Harvester (OTR)

**Ron Perry, Jim Flore, Nikki Rothwell,
Amy Iezzoni, Dan Guyer, Greg Lang,
Suzanne Thornsberry, Phil Schwallier**

Why Seek New Harvest Systems?



- Vision of the future:
 - Harvest of younger trees → earlier returns
 - Earlier returns → easier to establish new orchards
 - Earlier returns → easier to adopt improved varieties
 - New varieties → expanded markets for products (for example, dried cherry, juice concentrate, etc.)
 - Harvest of smaller trees → better fruit quality
 - Smaller trees → spray reduction/containment?
 - Avoid trunk shaker damage → better tree health
 - Continuous harvest → higher harvest efficiency
 - Continuous harvest → night harvest potential?

Harvesting tart cherries must continue to evolve....



54
Hand held "Homelite" branch shaker being demonstrated.

Our studies show that the usefulness of this unit is limited. The manufacturer, however, plans to make 750 of these machines available to growers in 1967.

Even fresh market sweet cherry harvest is evolving with new tree training systems matched to prototype harvesters





Trunk Shaker Harvester



USDA-Peterson Berry Harvester 05



Grant's BTR Harvester 06

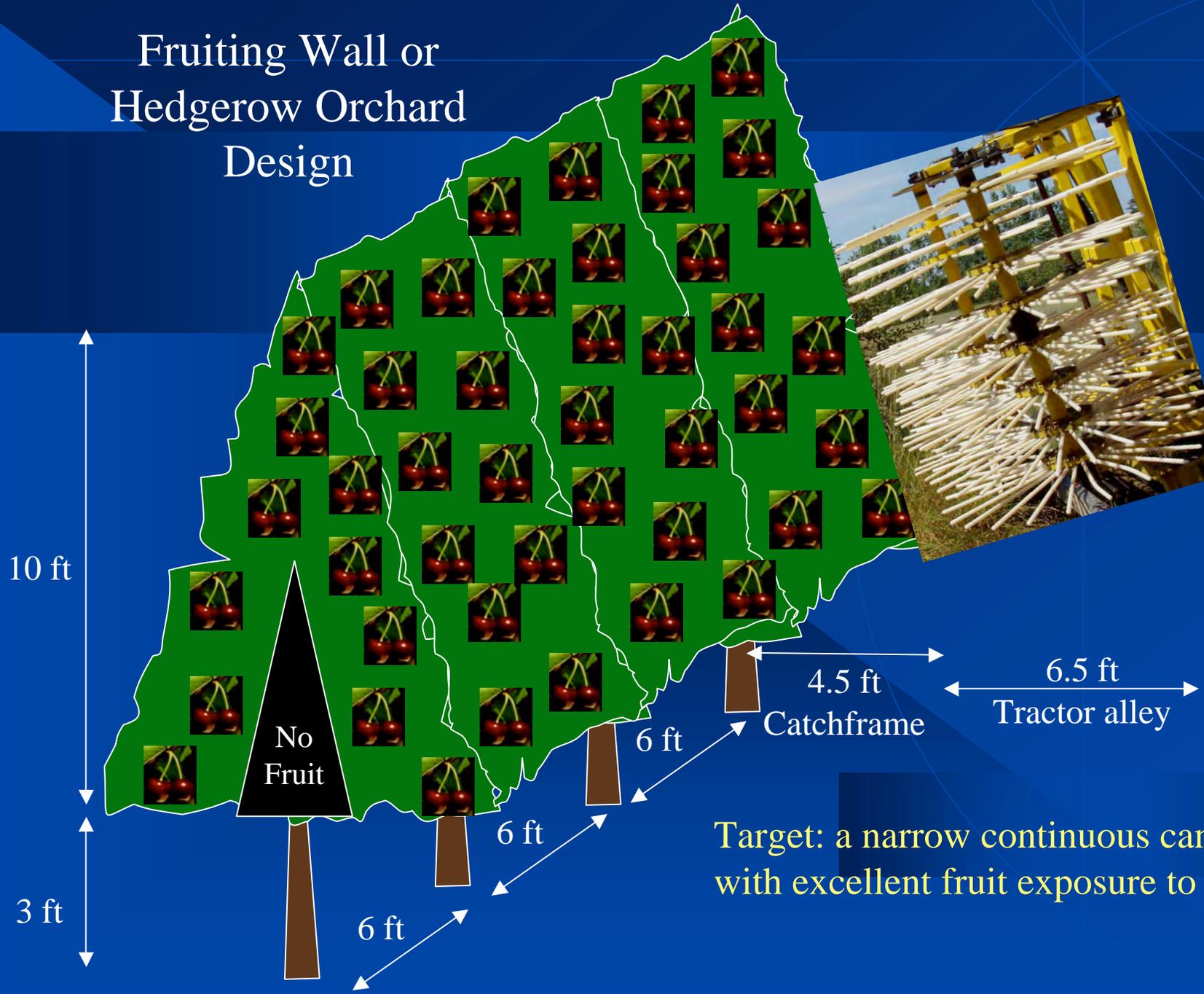


Oxbo Citrus Harvester 07





Fruiting Wall or Hedgerow Orchard Design



Target: a narrow continuous canopy with excellent fruit exposure to light

Citrus Harvesters



03/15/2007

Model 3220



Photo courtesy of Jim Flore

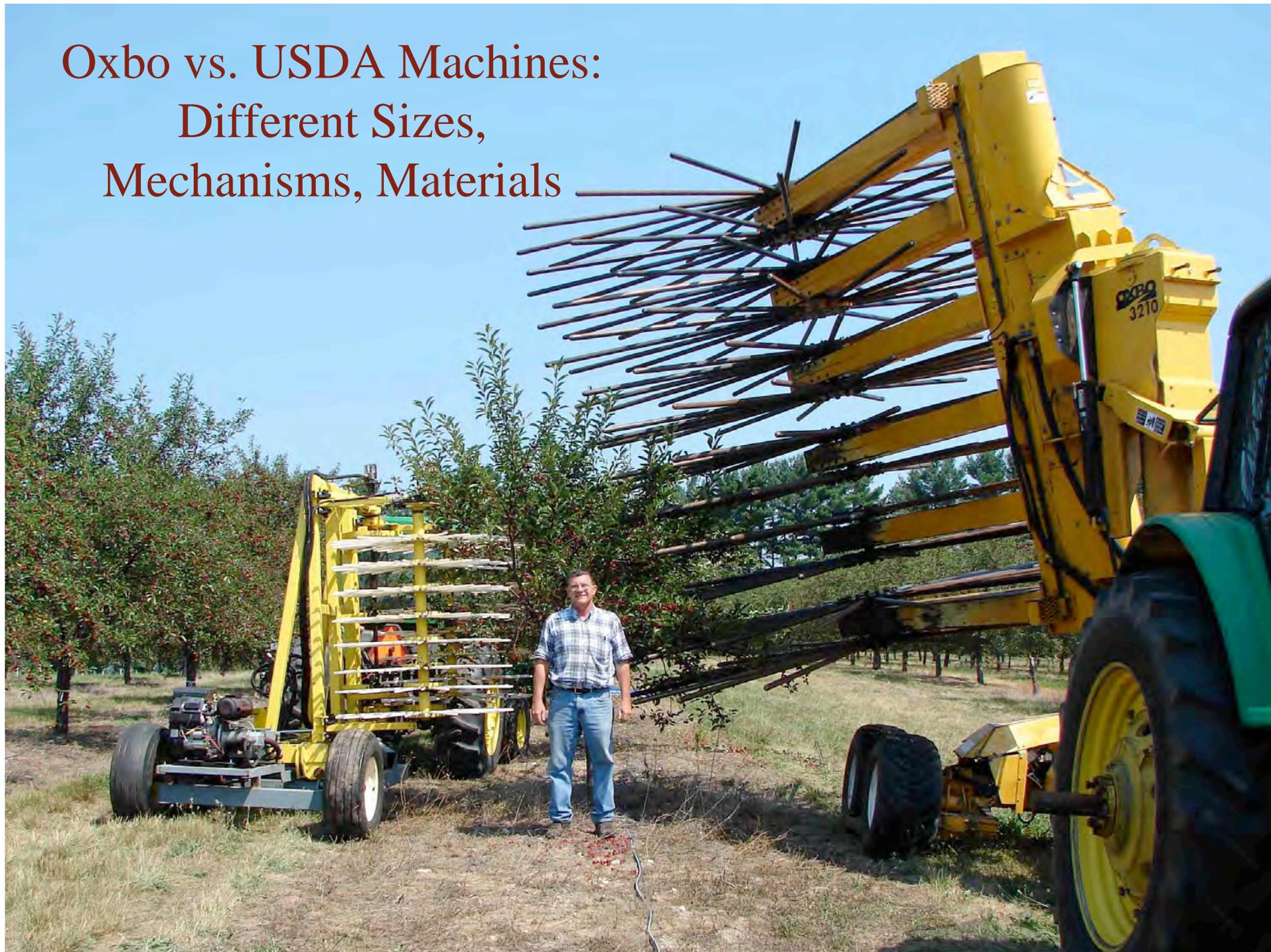
Photo courtesy of Jim Flore





Photo courtesy of Jim Flore

Oxbo vs. USDA Machines:
Different Sizes,
Mechanisms, Materials



KORVAN (Oxbo International) 7420



Three selections, south end Row 11 from west, CHES

7/15/08



Over-The-Row Tart Cherry Harvest Trial 2008

- Fruit was harvested from 45 trees at CHES, about 1-2 weeks past normal harvest maturity with no ethephon.
- Most trees were ~10 year-old MSU seedling selections plus Montmorency, planted at 6 X 14 ft with no training.
- MSU selection 25-14 (5 trees), Tamaris (3 trees) and Nana (2 trees) were ~6 years old, planted at a wider spacing on MXM 2 rootstock, and trained lightly since establishment.
- Trees had to accommodate the 5'X8' tunnel opening of the Korvan 7420 Blueberry harvester.



First 25 selections, CHES 7/15/08





Trial Summary

- Fruit pull force ranged from 150 to 600
- 85-95% fruit removal
- Branches above 10 ft had poor fruit removal
- A few small broken branches on untrained trees

Collecting fruit at various stages in harvester system





Harvested 7/16/08 and soft fruit test on 7/17/08 performed by N. Rothwell and E. Lizotte

Off The Tree	Soft Cherries	Total Cherries	Percent
Mont	6	106	5.7
2712 (12)	1	77	1.3
Tamaris	2	88	2.3
Nana	1	91	1.1
2514 (20)	0	82	0.0
2717 (1)	0	81	0.0
Conveyor			
2712 (2)	31	111	27.9
Tamaris	8	113	7.1
2514 (20)	23	237	9.7
2717 (1)	26	105	24.8
Lugs			
Mont	65	178	36.5
2712 (12)	52	145	35.9
Tamaris	74	227	32.6
Nana	36	156	23.1
2514 (20)	12	100	12.0
2717 (1)	15	120	12.5

Tamaris 9/18/08 Spur Type Variety



No damage to canopy and foliage

Project GREEN Proposal

- Dec 2008 Planning Meeting - Michigan Cherry Producers, OXBO Representatives and Michigan State University Research Team
- Montmorency on various rootstocks (NWHS) and compact tart cherry selections (NWHS, CHES) are in propagation for plots to study:
 - 1) Future tree canopy and orchard designs,
 - 2) Optimal growth and fruiting habits, and
 - 3) Continuous harvester prototypes and operational components



Korvan Picking Systems:

Dynarotor

Horizontal shaking rotary head. More aggressive removal of fruit with adjustable stroke.



Korvan Picking Systems:

Rods



Catching System

Questions?

MSU Tree Fruit
Research

