

WILD BLUEBERRY HARVESTER FACT SHEET

Small Box vs Semi-Automatic Bin Handling System

-- An Economic Comparison --



Figure 1: Small box handling system



Figure 2: Semi-automatic bin handling system

Background:

The wild blueberry industry has faced low prices over the last three years and requires cost-effective alternatives to reduce the harvest cost and ultimately the total production cost. Existing commercial wild blueberry mechanical harvesters have two main types of handling systems; i) traditional small box; and ii) semi-automatic bin handling. The upgrade and modification of a small box system to semi-automatic bin handling system requires an additional \$30,000. In this study, both commonly used box handling systems were compared using harvesters running a double head configuration (34" picking width per head). The results of this study will assist farmers in making decisions about adopting these new harvesting technologies.

Financial information used in this study

Wild blueberry price (\$/lbs)	0.25
Wild blueberry yield (lbs/acre)	4000-6750
Operator wage (\$/hr)	15
Labour wage (\$/hr)	12

Results & Recommendations:

✓ Field efficiency:

- 26% increase by in field efficiency using semi-automatic bin handling system
- Time savings up to ~30% using semi-automatic bin handling system
- Potential for ~25 increase in harvestable acreage annually (using double head configuration)
- Field efficiency depends heavily depends on harvester, operator and field conditions
- Bin handling system can harvest an additional ~500 lbs of berries per hour
- Bin handling system takes ~2.4 hours to harvest an acre compared to ~3.2 hours using a small box handling system
- Small box handling system requires an additional farm-worker for box handling while harvesting

✓ **Handling time comparison:**

- Small box system spent 26% time manually handling small boxes (loading/unloading)
- Bin handling system spent 8% of time handling of boxes mechanically (loading/unloading)

✓ **Upgrade from small box system to bin handling system:**

- Additional profit of \$273 per acre (due to increased field coverage) with a break-even of \$0.21 lbs⁻¹ (~ 5750 lbs/acre)
- Profitability mainly depends upon field conditions, for example:
 - Profitability for field yielding 4750 lbs/acre = \$226 per acre
 - Profitability for field yielding 5750 lbs/acre = \$273 per acre
 - Profitability for field yielding 6700 lbs/acre = \$321 per acre

✓ **Net returns using bin handling system (\$0.25 lbs⁻¹ blueberry price) scenario:**

- Outright purchase scenario; accounts for 45% harvest cost of total costs
- Net returns decreased by 72% when using rental services
- Net returns decreased by 123% when using custom harvesting services
- Outright purchase allows farmers to harvest additional acreage (i.e., custom harvesting)
- Government cost share harvest efficiency program increased the profit margin by 31%

Net returns using alternative harvesters (\$/acre)

Handling system	Outright purchase	Rental services	Custom harvesting
Small box	114	26	-30
Bin handling	131	36	-30

✓ **Labour wage increase affects the profitability of small box handling system:**

- Bin handling system does not require any additional labour for harvesting operation
- Increased labour wage by \$2-\$4 per hour decreased the profit margin by 3-6%

✓ **Depreciation cost based on acre for the alternative harvesters:**

- Small box system ~ \$171 per acre
- Bin handling system ~ \$137 per acre

✓ **Effect of berry prices on net profit using bin handling system:**

- \$0.25 lbs⁻¹ ~ \$131 per acre
- \$0.35 lbs⁻¹ ~ \$441 per acre
- \$0.45 lbs⁻¹ ~ \$732 per acre

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