

Hazelnut Processing

2012 Upper Midwest Hazelnut
Growers Conference

Hotel Winneshiek March 3rd

Adding Value Through Processing

- Hazelnuts are sold in-shell, kernels, oil, and meal
- At a minimum hazels will need to be husked
 - How do I do this?
 - What methods or equipment are available?
 - What will it cost?

Husking

Options for hazelnut husking

- Hand Husking – old reliable
- Bucket Husker – good first step
- Super Squirrel Husker – larger throughput
- UW Husker – newest possibility

Hand & Bucket Husking

- Time
 - Hand Husking 100 clusters= 25 minutes
 - Bucket Husker 100 clusters = 10-15 minutes
- Equipment
 - Hand Husking - Leather Gloves & cake pan
 - Bucket Husker - 3/8 or 1/2 Drill, 5 gallon bucket, some hardware pieces (less than \$50 if you already have the drill)

Hand & Bucket Husking

- Total cost for hand husking = \$3.00 - \$3.16/lb of in-shell nuts
- Total Cost for Bucket Husker = \$1.24 - \$2.74/lb of in-shell nuts

Potential Returns (not including harvest cost)

- Hand Husking = \$0.84 - \$1.00
- Bucket Husker = \$1.26 - \$2.76

Cracking

Options for cracking nuts

- Hand Cracker – old reliable
- DaveBilt Rotary Plate Cracker – first step
- Drill Cracker – works well but little long term info
- Universal Nut Cracker – good luck
- Crack-M-All – Norm Erickson mid size unit
- Cone Cracker – standard in the industry

Hand, Plate, Drill Cracker results

1 pound of in-shell nuts was tested with each option, timed; and results tallied

| Table 1 | HC | PC | DC |
|--------------------------|-----------|-----------|-----------|
| Total Time (min:sec) | 78 | 27 : 15 | 24 : 35 |
| Cracking | N/A | 2 | 1 |
| Separation | N/A | 25 : 15 | 23 : 35 |
| Whole Kernels (grams) | 122 | 89.3 | 104.2 |
| Kernel Pieces (grams) | 31 | 19.2 | 36.24 |
| Deformed Kernels (grams) | 10 | 0.7 | 1.8 |
| Shells (grams) | 288 | 177.2 | 262.7 |
| Un-cracked (grams) | N/A | 158.4 | 45.3 |
| ½ cracked (grams) | N/A | 3.7 | N/A |

Hand, Plate, Drill Cracker analysis

| Table 2 | HC | PC | DC |
|---|------|---------|---------|
| % Cracked | 100% | 63% | 89% |
| Total Time (min:sec) | 78 | 27 : 15 | 24 : 35 |
| Kernel Yield (grams) [whole kernels & pieces] | 153 | 108.5 | 140.4 |

Only the hand cracker had 100% crack out on the first pass. The mechanical crackers only did 63% to 89% of the total. Thus, the time it took is not accurate for 100% crack out. Adjusting the mechanical crackers time to reflect 100% crack out results in more time needed to do the job (Table 3)

| Table 3 | HC | PC | DC |
|---|------|---------|---------|
| % Cracked | 100% | 100% | 100% |
| Total Time (min:sec) | 78 | 42 : 35 | 27 : 20 |
| Kernel Yield (grams) [whole kernels & pieces] | 153 | 171 | 161 |

Hand, Plate, Drill Cracker Cost

| Table 4 | HC | PC | DC |
|-------------------|---------|--------|--------|
| Labor Cost/lb | \$12.48 | \$6.80 | \$4.37 |
| Equipment Cost/lb | 0 | \$0.24 | \$0.60 |
| Total Cost/lb | \$12.48 | \$7.04 | \$4.97 |

After determining a cost to crack nuts with the three methods (table 4), a financial analysis was developed assuming a price range for kernels of \$7 to \$14 per lb (table 5).

Hand, Plate, Drill Cracker Financial Analysis

| Table 5 | HC | PC | DC |
|--|-------------------------------|------------------------------|-----------------------------|
| Total Cracking Cost [per lb of kernels]* | \$37.44 | \$21.12 | \$14.91 |
| Kernel Price Range | \$7 - \$14 | \$7 - \$14 | \$7 - \$14 |
| Projected Returns | (-\$30.44 to -\$23.44) | (-\$14.12 to -\$7.12) | (-\$7.91 to -\$0.91) |

* Kernel is assumed to be 33% of total in-shell

None of the three methods are estimated to be profitable under the assumptions used (fairly conservative). Considering the short time involved with cracking compared to separation (table 1) the obvious area to focus on is separation of shell from kernels. Cutting the separation time in half would improve the financial picture considerably.

Results & Conclusions

- Processing is a bottleneck and needs to be addressed in order to have a salable product.
- Some lower cost options are available for small batches, with larger mid-scale options coming on-line soon
- Particular focus is warranted on aspirators, cyclones, and other separation methods to reduce the labor & cost of husking & cracking.

Jeff Jensen – Rural Advantage

507-238-5449

jeff@ruraladvantage.org

www.ruraladvantage.org

Processing Demonstrations

- Directions to Fairgrounds

Exit onto Water St. left (east) to Montgomery which curves south. Then take the very first left onto Main St. 2-3 blocks is the fairgrounds and the community building.