

1994 SARE Grant Final
Andy Leinoff/Eric Allen/Vermont Cereal Co.

/Final Report

The delay in getting things running forced us to bring one more load of unprocessed oats to Ontario to meet demand. We hauled about 1,500 pounds and got back about 1,300 pounds of rolled oats. The cost of processing this inventory in Ontario was \$971.37 (\$.74 per pound). The actual mill charge was only US\$156.39 (\$.10/lb). The extra \$.64/lb was the cost of hauling the crop out and back from Ontario. The cost of equipment we have assembled, and based on the cost of the fixed assets of our plant, excluding the cost of the vibratory packer, the cost of the equipment to steel cut oats and the cost of the consulting fees covered by the SARE grant is \$34,278.55. Based on our estimate of 500,000 pounds of oats processed within a five year period in the cost of our production facility is about \$.07 per pound. We estimate it will take about 20 hours of labor to run a batch of oats if the operator is also doing other mill work such as operating our bag stitcher or running an inventory accounting. A batch is about 3,000 pounds. This is about \$.06 per pound if labor is reimbursed at \$10/hr.

Therefore it cost about \$.13 per pound to process our oats, exclusive of the cost of electricity, and natural gas. WE HAD HOPED THE COST OF PRODUCTION WOULD BE \$.10 PER POUND IN OUR GRANT APPLICATION. This is a tentative success. Tentative in the sense that we have not had enough experience operating our facility to reliably determine the energy cost and real amount of labor associated with each run of finished goods. We may find that when we establish a regular schedule of production, the mill operator can do other jobs (such as stitching bags closed or taking inventory) while the milling process is taking place, so that the man hours allocated to the production process will be reduced.

The way the processing worked is as follows:

1. After oats were combined, we trucked them to the mill in an open Mack truck borrowed from Keith Burt of Cabot. Keith hays our fields not under oat cultivation and the use of his truck for hauling oats was part of the deal. We had to cover the truck with a tarp many times at the mill because the weather was so wet last fall and we had no place under cover to put the truck. Some days we didn't get the truck of oats back to the mill until after dark and sometimes we didn't have enough harvested oats to process a batch in our dryer. The moisture content of the oats from the field was about 18%. We measured this with a moisture meter we found in Will Ameden's attic that had been used to measure the moisture content of corn. We never filled the truck more than about 14" deep with harvested oats. Even so, the oats were warm to the touch and had to be stirred when left over night.
2. We unloaded the truck with a 20 foot auger borrowed from Bob Light of Plainfield in exchange for replacing one of its end bearings. The oats moved directly from the truck into the grain dryer. The dryer required about 120 bushels to operate properly so it would automatically discharge the dried grain out and up the discharge auger. The moisture content of the dried oats coming out of the dryer was about 9%.
3. The dried oats were moved up to the road level of the mill and dumped into the main bin which was in the basement of the mill. There are three hatches into this bin on the road level of the mill. The auger output was shuted into one of these hatches with 8" stove pipe. Different hatches were used to more evenly distribute the oats in the one huge bin. We estimate that the bin holds 500 bushels.

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4. The oats were drawn out of the main bin into right (looking away from the road) cup elevator and raised to the second floor of the mill where they were put through the cleaner. The chaff was sent out of the mill and down a 10" stove pipe along the outside of the mill to a waiting 50 gallon garbage can. We had to empty this several times. We used this chaff as sheep bedding and gave it away for animal bedding to Will Ameden for his tenant's heifers. There is also a couple of 5 gallon buckets of mustard seed that comes out of the unprocessed oats with the first cleaning. This we threw away in the woods since nobody seemed to want the stuff. The first cleaned oats were conveyed via 4" PVC pipe to one of the three small bins on the road level of the mill. Two of these bins each has a capacity of about 90 bushels. The third has a capacity of about 100 bushels.
5. The oats were then moved out of the road level bin to the right cup elevator up to the second level and shot into the huller. The three road level bins discharge into an auger that can move material to the left or right depending on the direction it turns. To the right, the material is conveyed into the cup elevator that also goes down into the basement level. To the left, the material is conveyed into the cup elevator that goes only from the road level to the second level of the mill. The hulls are discharged into the exterior downshute and into the garbage can for bedding. A couple of 5 gallon buckets of broken oats comes off at this step. The first hulled oats are conveyed into one of the two small road level bins.
6. The first hulled oats were sent into one of the cup elevators and cleaned again. They were returned to one of the small bins.
7. The oats were then cleaned three more times and returned to a clean road level bin.
8. We estimate that 30% of the total initial weight of the oats in a run from the main bin are lost as chaff or broken oats. About 25% of a run are oats that are small or large oats culled by the cleaner. These are to be used for steel cut oats. About 45% of a run can be used for rolling.
9. The cleaned and hulled oats were drawn up into a cup elevator and released into a portable horizontal auger on the second level of the mill. Water was dripped into this auger as it transferred the oats into a second road level storage bin. This infuses moisture into the oats and brings their moisture content up to about 18% from 9%. The damp oats sat in a bin overnight.
10. The oats were augered into the right cup elevator and sent into the propane fired toaster. They were heated up to 160° F. This destroys an enzyme in the oats that promotes rancidity after the oat is rolled. The toasting process is meant to provide an 18 month shelf life for the product. The toaster is simply a revolving horizontal barrel inclined at about 15°. The oats go in on the up side and as the barrel turns, paddles convey the grain to the down side. There is a propane heat gun underneath the toaster barrel. At the lower end, the oats are scooped into a sheet metal trough that conveys them to the left cup elevator.
11. The toasted oats are sent directly into the roller and then into the leftmost road level storage bin. If the toasted oats are too dry, the rolled oats will crack and be unacceptably powdery. If the toasted oats are not heated enough, the risk of spoilage increases.
12. We then convey the rolled oats by the left cup elevator to the second level and direct them into the packer that sits in the insulated packing room on the road level. The packer weighs out a measured amount of rolled oats and dumps it down a funnel under which we position a zip lock bag or large bulk bag.
13. We have had some instances of rolled oats that started to mold. We believe this is because the packed oats were not adequately dry. We are getting a small fan to install at the top of the finished oat bin to draw air through the bin which was constructed with a wire mesh floor for just such a purpose. We will run the fan, stirring (raking) the finished oats until a moisture content of about 9% is attained.

The delay in getting the operation going also affected sales. The prime selling season for oatmeal starts in November. We were busy trying to make our product. We were also caught up in constructing the mill throughout most of the summer and fall. This did not permit us to spend much time marketing our product, not to mention that we were not sure that we would have anything to market and even if we grew oats, we were not positive our facility would get finished. Hauling oats to Ontario, as we were forced to do once to meet sales demand, would have not been an economic undertaking. The delay and less than hoped

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for sales were not without a positive effect. Our accounting system is developing and would have been unable to fully cope with much more in the way of sales. It is barely capable of generating this report! Our occasional mold problem is solvable, but it requires a little diligence on our part. It is preferable to have such a problem before distribution becomes too widespread. We are still learning about the production process and making improvements along the way. We have over toasted some runs and had to feed the results to the sheep. We have had uneven rolling due to irregular flow into the roller and fed the results to the sheep. We have very well fed and well bedded sheep.

We believe additional economies of operation can be had from the sale of chaff as organic animal bedding and broken oats for animal feed. The total harvest was about 20,000 pounds or 468 bushels. We estimated the volume of oats harvested by their volume in a borrowed truck used to haul the harvest after combining. It was very wet combining this year. We weighed a measured bushel at 42 pounds. Typically a bushel of oats measures at 32 pounds. We think we had a lot of water with the harvest. One area for improvement next year is to be more careful determining the weight of the oats harvested. We will measure their moisture content and weigh our truck empty and full of oats, then correct for 15% moisture.

Table B presents some statistics for our growers in the summer of 1994.

Our growers experienced very mixed results this past summer. Eric's #1 field suffered from extensive lodging. The seed company suggested the seeding rate or nitrogen content or both were too high. Field #1 was somewhat exposed to wind. Eric's #2 field was planted later because it was somewhat wetter and didn't dry out as quickly as field #1. The seed rate was above the company recommended 75 pounds per acre. Eric's #2 field took a long while (it seemed) to germinate and looked pretty scraggly for its first month. It also experienced about 25% lodging in the first two weeks of August, but what stood yielded well. Will over-seeded and planted in a fairly exposed location. Many growers overestimated their acreage and consequently used too much seed. We walked their plots with a measuring wheel after harvest and established a more reasonable estimate of the acreage cultivated. In addition, Will got married and went on a honeymoon during planting season so hence he finished later than he had expected. Glen used about the right amount of seed. His plot was river bottom and well sheltered. He had a little problem with too much moisture both during planting and when he tried to combine at the end of August. Joey significantly overestimated the acreage he planted. Despite the overseeding, Joey experienced little lodging. However, his river bottom, sandy soil had not been fertilized in recent memory and his oats were short (stunted actually) and yielded small sized groats. The gross payment per acre to each grower includes an allowance for combining of \$50 per acre. Eric's #2 field, Glen's field and Joey's garnered a respectable per acre return to each.

Outreach to grower participants include this report and two communications we called OATNOTES. Copies of OATNOTES accompany this report after the tables.

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TABLE B

grower	location	date planted	date harvested	acres planted	lbs of seed planted	seeding rate	harvest in bushels	yield bu/acre	yield lbs/acre*	gross payment per acre**	\$/acre less*** seed cost
Eric Allen #1 field	Cabot	May 8	Aug 28	4.0	396	99.0	30.0	7.5	315.0	\$88	\$70
Eric Allen #2 field	Cabot	May 15	Aug 28	3.5	440	125.7	120.0	34.3	1,440.0	\$221	\$199
Will Ameden #1 field	Cabot	May 19	Aug 28	3.2	440	137.5	32.0	10.0	420.0	\$100	\$75
Will Ameden #2 field	Cabot	June 6	Aug 29	3.2	528	165.0	56.0	17.5	735.0	\$138	\$108
Glen Burkholder	Wolcott	May 5	Aug 20	4.5	396	88.0	175.0	38.9	1,633.3	\$244	\$228
Joey Klein	Plainfield	May 21	Aug 26	2.0	528	264.0	55.0	27.5	1,155.0	\$188	\$140
total/avg				20.4	2,728	133.7	468.0	22.9	963.5	\$165	\$140
* @ 42 lbs/bu											
**\$5/bu plus \$50/acre for combining											
**\$16 per 88 lbs of seed											