Cost of Onion Production in Idaho and Eastern Oregon 2020

General Procedure

A link to a survey of production practices is distributed to Idaho-Eastern Oregon Onion growers by mid-November of each year. Results from the anonymous survey of are combined with information from crop consultants, ag supply companies, and extension personnel to develop a set of production practices for use in the annual cost of production estimates.

Preliminary hard copy cost of production reports are distributed to Idaho Eastern Oregon onion growers by mid-February of each year. Adjusting entries are recorded based on feedback from industry. Final cost of production reports and downloadable spreadsheets are made available electronically in spring of each year.

In the 2020 production cycle, industry feedback resulted in the following adjusting entries being made to the budgets before posting:

- **An additional herbicide targeted at grass was added to the plant protection section of the budget.**
- **The water assessment was moved to a separate line item under the irrigation heading of the budget.**

Additional Considerations:

The draft copy contained a typo in the total cost section of the written report. The reference to total costs in appendix A read $10,368 but should have read $10,638 (the figure reflected in the budget). The error was corrected and the total has been updated to incorporate the adjusting entries outlined above. Those utilizing the cost of production worksheets should be aware that estimates reported in the final budgets are subject to small rounding errors.

Fuel prices appearing in the budgets reflect the unusual circumstances brought about by the COVID-19 pandemic and are not typical. The price used as a proxy for dyed diesel in the budget is based on historical data reported by the US Energy Administration in December of 2020 and is reflective of WHOLESALE pricing. Individuals utilizing this document and accompanying spreadsheets should exercise caution and consider adjusting the fuel pricing to match with current market conditions.

Procedural Changes from the 2019 to the 2020 production cycle

Direct comparisons with previously published estimates should not be made without accounting for differences in procedures, product use, and assumptions. A number of changes were made from 2019 to 2020. Difficult weather conditions in 2019 resulted in many producers having to lift onions twice. The 2020 budgeted fuel requirements were adjusted to reflect normal harvest conditions and were based on lifting onions once. At the request of industry, two custom aerial applications replaced two ground applications in the 2020 budget. In 2020, the budgeted fuel required for hauling was replaced with a custom haul charge, a change from the 2019 production cycle.

The 2020 budget reflected an increase in herbicide use and a decrease in use of hand weeding crews. The increase in herbicide use resulted in an increase in the overall number of spray applications in the 2020 production cycle. The final 2019 budgets offered consideration of two different herbicide programs. All 2020 budgets were standardized to use the same product mix, allowing for more accurate comparisons from one year to the next.

Some of the equipment in the “model” farm used to generate the budget was aging and due for replacement in 2020. Due to market uncertainty the equipment was not replaced, instead the budget was adjusted to reflect higher repair costs characteristic of older machinery.

Product Changes

Vapam replaced Chloropicrin as the fumigant used in the 2020 budget. Manzate Max and Zing replaced Bravo, Dithane, and Quadris in the fungicide section of the budget.

Objectives and Limitations

The goal of this project is to provide industry stakeholders tools for estimating and understanding the costs incurred by onion producers in Idaho and Eastern Oregon. The first budget (Appendix A) is based on **marketable yields** and includes the cost of storage and packing. The second budget (Appendix B) is based on field run yields and includes the cost of storage but omits packing charges.

The estimates developed in this document are intended to capture typical production practices and input use of Treasure Valley onion growers but **cannot capture the exact cost structure and resource use of each individual farm.** Prices and yields used in these documents are based on **historical averages.** Practices outlined in this document are not endorsements or recommendations for any particular product or practice used in the production of onions. Farm size, **acres planted to onions**, equipment choice, rotation, irrigation practices, and management will vary and are unique to each individual operation.

Farm Size and Rotations

The costs and returns estimates for Treasure Valley onion production estimated in this document are based on a hypothetical 1,200 acre "model" farm. The hypothetical farm produces onions on 150 acres irrigated with a drip system designed for a "conventional" bed. In addition to onions, the model farm represented in this budget produces sugarbeets, dry beans, corn, and wheat. Choice of rotation crops and length of rotation will vary by producer, field conditions, and the whole farm plan.

Yield and Price Considerations

Yields vary based on soil type, variety, location, and weather. Yields used in the field run budget (Appendix B) are based on historical three-year average (2017-2019) yields for Idaho and Malheur County Oregon reported by the United States Department of Agriculture National Agricultural Statistics Service (USDA-NASS). Yield estimates for 2020 were not yet available for publication in this document.

Marketable yields used in (Appendix A) are calculated by adjusting the 3-year average field run yields. Adjustments are based the assumption that, on average, 10% of the crop will grade in the super colossal size class, 20% of the crop will grade in the colossal size class, 40% of the crop will grade in the jumbo size class, 20% of the crop will grade in the medium size class, and 10% of the crop will fall in the cull category.

Prices used in Appendix A are based on season averages from the USDA **Agricultural Marketing Service Market News Reports.** The simple average of weekly high and low (FOB prices) by size class for **50# sacks** of yellow onions shipped from Idaho and Malheur County Oregon from October of 2018 through January 2 of 2021 are reported under the price heading of the budget. Actual price received will depend on **timing of sales** and can deviate **above or below the simple average reported** in the budget. **When using this document, caution must be exercised to apply pricing that is representative and accurate to each individual operation being considered.**

Three-year average (2017-2019) USDA-NASS marketing year average prices for Idaho and Malheur County Oregon reported in **dollars per hundredweight** are used as a proxy for a field run price (Appendix B).

Seed

Seed costs will vary based on variety, seeding rate, treatment and coating applied. Seed costs were budgeted at $592.02 per acre, up $22.77 per acre (4%) when compared to the $569.25 per acre estimate reported in 2019.

Fertilizer

Fertility needs will vary with location and soil type. Soil tests are required to determine precise nutrient needs for individual producers. The cost of soil testing in 2020 was budgeted at $5 per acre, no change from the 2019

production cycle. Overall fertilizer requirements were estimated based on use of nitrogen, phosphorous, and potassium. A small allowance was made to capture the cost of micronutrients and/or use of sulfuric acid. In 2020 total fertilizer costs were estimated to be about $204.30 per acre, a decrease of 0.60% when compared to the $205.55 per acre budgeted for the 2019 crop year.

Plant Protection

Fumigation

Vapam replaced Chloropicrin in the 2020 budget. The price of Vapam was budgeted at $7.00 per gallon. Growers using chloropicrin could expect to pay around $80.00 per gallon, a $5.00 per gallon increase over 2019. Custom fumigation services were budgeted at $45.00 per acre, a $2.50 per acre increase over the rate of $42.50 per acre budgeted in 2019. The custom application charge appears in the "Custom and Consultants" section of the budget.

Weed Control

Herbicides

In this budget, a combination of chemical applications, mechanical cultivation, and use of hand crews are assumed for suppression of weeds. Due to the significant change in methodology that budgets a tradeoff between herbicide use and hand weeding crews, caution must be exercised when making comparisons from the 2019 to the 2020 production cycle. A total of $109.41 per acre was budgeted for herbicides in 2020. In 2019 herbicide costs were budgeted to range between $63.19 per acre and $72.99 per acre, but the lower herbicide cost/use was offset by the assumption of greater use of hand weeding crews. The higher allocation to herbicides in 2020 is driven by changes in the product mix, and an increase in the overall number of herbicide applications. Adjuvants represent an important consideration within the overall plant protection plan and are accounted for in the last line of the Plant Protection section of the budget.

Cultivating

In 2020 the onions were assumed to be cultivated 3 times for weed control, no change in comparison to the 2019 production cycle. Tractor hours and fuel use are estimated based on using a 160 horsepower (HP) wheel tractor and a 4 bed onion cultivator. Fuel, labor, and machinery costs for cultivating are accounted for and discussed in the "Machinery" and "Labor" sections of the budget.

Hand Weeding

The 2020 budget assumed hand weeding crews were used once during the 2020 growing season at a charge of $120 per acre. The 2019 budget assumed use of hand crews 3 times throughout the growing season, at an estimated charge of $125 per acre. Overall hand weeding costs were estimated $255 per acre lower in 2020 when compared to 2019. The cost of hand crews for weeding appears in the "Custom and Consultants" section of the budget and can vary widely based on location and individual farm.

Insects

For Treasure Valley Onion growers one of the most serious concerns is thrips and thrips transmitted Iris yellow spot virus (IYSV). Thrips pressure will vary from year to year, field to field, by location, and with environmental factors. Management costs will depend on severity of pressure, and choice of products used. The 2020 production cycle assumed the same number of insecticide applications and the same product mix as were budgeted in 2019. The cost in 2020 was estimated at $332.89 per acre, an increase of $13.02 per acre when compared to the $319.87 per acre recorded in the 2019 production cycle.

Diseases & Other Treatments

The majority of growers estimated using 4 fungicide applications during the 2020 growing season, no change from the number of reported fungicide applications in the 2019 growing season. A total of $136.70 was

budgeted to the fungicide category in 2020, whereas $130.60 was budgeted in 2019. The $6.10 per acre increase in fungicide costs in 2020 is attributable to changes product use and changes in product pricing.

Use of chlorine dioxide for maintenance of the drip lines was budget at $30 per acre in 2020, a $10 per acre decrease when compared to the $40 per acre budgeted for this expense in 2019. One application of MH-30 at a cost of $31.92 was budgeted in 2020 to help with control of in storage sprouting. The cost of MH-30 in 2020 was down $1.33 when compared to the $33.25 budgeted for this expense in 2019.

Year over Year Comparisons Plant Protection Category

In 2020 total plant protection costs (herbicides, insecticides, fungicides, and other treatments) were estimated to be about $942.92 per acre. In the 2019 production cycle plant protection costs were estimated to range from $896.91 to $916.71 per acre. Overall, expenses in the plant protection category were estimated to increase between 2.8% and 5.1% in 2020 when compared to the 2019 production cycle.

Fuel

All fuel charges that appear in the budget are estimated using pricing from the United States Energy Information Administration. Wholesale pricing for Number 2 diesel is used as a proxy for the dyed (off road) diesel price. Fuel prices often fluctuate, and **actual price paid will depend on when fuel is purchased**. To arrive at a representative figure for fuel pricing and to help smooth variation associated with the timing of fuel purchases, a nine-month average is used in the budget. The calculated nine (Jan 2020-Sept 2020) month average of $1.27 per gallon was use in the 2020 budget, a $0.68 per gallon decrease in comparison to the 2019 production cycle.

On road diesel was estimated using the nine-month (Jan 2020-Sept 2020) retail average price of $2.54 per gallon, a $0.46 per gallon decrease when compared to the 2019 production cycle. On road gasoline pricing was based on the nine month (Jan 2020-Sept 2020) retail average price of regular gas in the Rocky Mountain region of $2.25 per gallon, a $0.35 per gallon decrease in comparison to the 2019 production cycle.

Irrigation

Water Assessment
Surface water assessments are based on a simple average of fees charged by irrigation districts in the region. A charge of $66.75 per acre is budgeted for irrigation assessments in the 2020 production cycle. At the request of industry, the water assessment is included as a separate line item in the final 2020 budget.

Pumping Charge

This budget assumes the pump used to supply the drip system with water is powered by a diesel engine. Energy requirements for operating the pump are estimated using standard agricultural engineering formulas that relate PSI, pumping lift, and irrigation application rates to the Nebraska Performance Criteria (NPC) water horsepower value for diesel fuel. Onions receive 30-acre inches of water throughout the growing season. A minimum of 20 gallons of diesel fuel per acre would be needed to power the pump. Applying the $1.27 per gallon dyed diesel charge to the 20 gallons of fuel results in a total charge of $25.41 per acre dedicated to fuel for irrigation, a decrease of $13.61 per acre when compared to the 2019 season.

Irrigation Repair

Repair and maintenance on the pump are estimated to cost $5.00 per acre, no change from the 2019 production cycle.

Drip Supplies and Labor

Drip tape and supplies are budgeted at $250 per acre, no change from the 2019 production cycle. Labor for setting up and removing the drip irrigation system is budgeted at 8 hours per acre, no change from the 2019 production cycle. While the number of budgeted hours did not change from the 2019 production cycle to the 2020 production cycle the hourly rate did increase. In the 2020 budget the effective rate for H-2A labor used to

set up the drip irrigation is estimated to be $17.72 per hour. Detailed descriptions of wage rates are outlined in the "labor" section of this document. The $10 per acre charge to cover drip tape disposal expenses is unchanged from the 2019 production cycle.

Overall, the irrigation category in the 2020 production cycle was about 2% lower than in the 2019 cycle because of lower diesel prices used to power the pump.

Machinery

Variable Costs of Machinery

The operating or variable cost categories that appear under the Machinery heading in the budget include charges allocated to off road diesel for tillage, spraying, planting, and harvest operations. A small charge to cover road gas and diesel for pickups and service trucks used on the farm is allocated to the budget. Machinery repairs, lube, and custom hauling charges also appear under the machinery heading of the budget.

Tillage and Harvest Practices Used to Calculate Fuel Requirements

The majority of tillage and harvest practices used to calculate fuel requirements were assumed to be the same in the 2020 production cycle when compared to the 2019 cycle. The notable exceptions include budgeting for one additional ground application overall in 2020 and substituting two custom aerial applications for two ground applications that had previously been assumed to be applied via ground rig. Onions were assumed to be lifted once in the 2020 production cycle, a change from the assumption of having to lift twice in the 2019 production cycle due to inclement weather.

Fuel Consumption Calculations Appearing in the Machinery Section of the Budget

Fuel consumption per hour for all field and harvest operations that are not custom applied are estimated using agricultural engineering equations. Horsepower is related to fuel consumption per hour using a factor of 0.044 for diesel. An example calculation for per hour fuel consumption is provided for a 160 HP tractor (160 X 0.044 = 7.04 gallons per hour of use). Fuel costs per hour are calculated by using the estimated fuel consumption of each operation multiplied by the cost of diesel fuel. Using our previous example ($1.27 X 7.04=$8.94 per hour).

Acres per hour calculations are used as intermediary step in estimation of final costs used in the budget and apply the following agricultural engineering formula.

$$\frac{\text{Speed (mph)} \times \text{machine width (ft)} \times \text{machines field efficiency (\%)}}{8.25}$$

In the budget, all machinery hours (tractor + implement) are aggregated to arrive at a single per acre value before applying the cost of diesel fuel. In 2020, estimated fuel use was budgeted at of 41.67 gallons per acre. The $1.27 per gallon price for diesel is applied to arrive at an estimated cost of $52.92 per acre for fuel in the 2020 growing season. The estimated charge represents a decrease of $31.67 per acre when compared to the 2019 production cycle.

Repairs & Maintenance

The repair factor was $8.17 per acre higher in the 2020 crop cycle when compared to the 2019 cycle. The higher repair factor is representative of aging equipment that was not replaced due to market uncertainties associated with the COVID-19 pandemic.

Lube

Lubrication costs are estimated using the standard engineering coefficient of 15 percent of estimated fuel costs and were estimated to be about $9.76 per acre, a decrease of $5.06 per acre when compared to the 2019 production cycle.

Hauling Charge

In 2020 the budgeted fuel required for hauling was replaced with a custom haul charge, a methodological change from the 2019 production cycle. The charge for hauling is estimated to vary from $6.00 to $9.00 per ton but will depend on distance. In 2020 the charge is budgeted to be $7.00 per ton.

Overall, the fuel, lube, repair, and hauling charges appearing in the machinery category were budgeted at $439.78 per acre in the 2020 production cycle. The costs budgeted in 2020 represent a decrease of $48.04 per acre when compared to the 2019 production cycle. The 9.8% reduction in total variable machinery costs is attributable to a decrease in fuel prices and hauling charges. Since the methodology for estimating hauling charges was significantly different in 2020 and estimated yields were down in comparison to 2019, **extra caution needs to be exercised when making comparisons between the two production cycles.**

Labor

Assumed wages include a base hourly rate plus adjustments for payroll taxes, workman's compensation, and benefits. Base H2-A hourly rates were up $0.14 per hour in Idaho and $0.90 in Oregon from 2019 to 2020. The H-2A rates in 2019 were $13.48 in Idaho, and $15.03 in Oregon. In the 2020 budget the average (Idaho and Oregon) H-2A rate of $14.77 per hour was used. Applying an average labor cost subjects the budget to error by underestimating labor costs for Oregon producers, while overestimating labor costs for Idaho producers, but provides a single estimate that can reasonably be used as a proxy to capture both states in a single budget. Those using this document should factor the actual labor rate applicable to the state where they farm.

For locally sourced labor used in the general labor category, the average from the Pacific and Mountain I regions of the 2020 USDA (NASS) Farm Labor Report are used. The estimated wage rate for 2020 was $14.40, a 2.86% increase over the $14.00 per hour used in the 2019 production cycle. The locally sourced skilled labor rate (truck driver and equipment operator) is factored at 15.81 per hour, a 2% increase over the $15.50 per hour used in the 2019 production cycle. Sorters and pickers are paid at a base rate of $11.33 per hour in the 2020 budget, a 3% increase in comparison to the $11.00 per hour wage rate used in the 2019 budget.

The H-2A labor rate is adjusted by 20% to cover meals and transportation, resulting in an effective rate of $17.72 per hour in the 2020 budget. A 15.25.% percent adjustment (to cover payroll taxes and workman's compensation) is applied to the base rate for general labor, truck driver labor, and sorting labor categories resulting in effective rates of $16.60, $18.22, and $13.06 per hour in the 2020 budget. The labor rate for machinery (tractor and harvest equipment) operators is adjusted by a factor of 25.25% to cover workman's compensation and payroll taxes resulting in an effective wage rate of $19.80 per hour in 2020.

The overall labor cost decreased 1.1% in the 2020 production cycle when compared to the 2019 production cycle. The change was due to **fewer labor hours** being used as a result of substitution of custom spray applications for owner supplied spray applications.

Storage & Packing

Storage and packing costs were unchanged from the 2019 to the 2020 production cycle. The budgeted charge for bin rental and storage operating costs was $1.00 per cwt stored. The charge for packing was estimated at $3.50 per **50# sack.**

Fees & Crop Insurance

The allocations for crop insurance, assessments, and GAP audits remained unchanged from the 2019 to the 2020 production cycle. Crop Insurance was budgeted at $84.00 per acre. The assessment fee for onions grown under the federal marketing order in the Idaho-Eastern Oregon region was $0.05 per cwt. The budget included a $10 per acre allocation to cover the costs of GAP audits.

Operating Interest

Operating Interest is based on a borrowing period of 6 months and is calculated at 5.45% of total operating costs. Operating interest in 2020 was 0.80% lower than the 6.25% rate applied to the 2019 production cycle.

Overall Operating Costs in Appendix A were estimated to be $313.31 per acre lower in 2020 when compared to the estimates calculated in Appendix A of the 2019 production cycle. The 3.25% decrease is due primarily to a significant reduction in budgeted use of hand weeding crews, lower fuel costs, and lower operating interest. In addition, average yields were estimated to be lower than were estimated in previous budgets, which reduced the overall number of onions stored and packed. **Actual yields will vary by location and those using this document should apply yields representative of their operation.**

Overall operating costs in Appendix B were estimated to be $183.38 per acre lower in 2020 when compared to the estimates calculated in Appendix B of the 2019 production cycle. The 4.14% decrease was driven by a significant reduction in budgeted use of hand weeding crews, lower fuel costs, and lower operating interest as well as lower bin rental charges resulting from a decrease in estimated yields.

Fixed Costs

Fixed costs categories for onion production in the treasure valley include:

(1) Depreciation and interest on machinery

(2) Machinery insurance and housing

(3) Land Rent

Equipment values are representative of a mix of new and used equipment. The USDA Prices Paid Index for farm machinery was used to make valuation adjustments from the 2019 to the 2020 production cycle. No equipment was replaced in the 2020 production cycle.

Interest is an opportunity cost of capital and is charged for all capital outlay not just the amount borrowed. The interest rate in the fixed cost section of the budgets is estimated at 4.86, a 0.56% decrease when compared to the 5.42% rate used in 2019 production cycle.

Housing and Insurance are estimated at 1% of the Average Annual Investment calculated for each piece of equipment used on the farm.

Land Rent

The cash land rent in the 2020 production cycle was budgeted to be $316 per acre and is based on USDA cash land rent surveys. The cash land rent does not accurately capture the costs associated with land ownership.

Overhead Cost & Management Fee

Overhead costs are calculated at 2.5 percent of total operating costs to account for office expenses, accounting fees, and utilities. The allocation to management is estimated at 5% of operating costs. The management fees in appendix A are based on adjusted variable costs (variable costs – packing charges).

Total Costs

Total (Fixed + Operating) costs in Appendix A were estimated to be $10,662.31 per acre, a decrease of $382.80 per acre when compared to the 2019 production cycle. The 3.47% decrease in total costs was primarily attributable to a significant reduction in budgeted use of hand weeding crews, lower fuel costs, and lower interest rates. Total (Fixed + Operating) costs in Appendix B were estimated to be $5,444.61, a decrease of $255.56 per acre when compared to the 2019 production cycle. The 4.48% decrease in total costs was primarily attributable to a significant reduction in budgeted use of hand weeding crews, lower fuel costs, and lower interest rates.

Acknowledgements

I want to extend my most sincere appreciation to all segments of the onion industry for providing information to support this work. Funding provided by the Idaho-Eastern Oregon Research Committee makes this analysis possible.

Appendix A Cost of Production with Storage and Packing, **Marketable Yields**

	Quanity	Unit	Price	$/acre
Super Colossal	158	50 # Sack	$8.44	$1,333.52
Colossal	314	50 # Sack	$7.60	$2,386.40
Jumbo	628	50 # Sack	$6.77	$4,251.56
Medium	314	50 # Sack	$6.80	$2,135.20
Total	1,414	50 # Sack	$7.15	$10,106.68
Seed				
Seed	0.33	pail	$ 1,794.00	$592.02
Subtotal Seed				$592.02
Fertilizer:				
Dry Nitrogen - Pre-plant	50	lb	$0.51	$25.50
Dry P2O5	115	lb	$0.52	$59.80
Micronutrients/Sulfuric Acid	1	ac	$25.00	$25.00
K20	100	lb	$0.37	$37.00
Liquid Nitrogen	100	lb	$0.57	$57.00
				$204.30
Plant Protection:				
Vapam	40.0	gal	$7.00	$280.00
Select	16.0	fl oz	$0.94	$15.04
Dual Magnum	2.0	pint	$15.63	$31.26
Roundup	22.0	fl oz	$0.16	$3.52
Outlook (2x)	21.0	fl oz	$1.25	$26.25
Buctril	1.5	pint	$7.25	$10.88
Goal Tender (2x)	10	fl oz	$1.02	$10.20
Prowl H2O (2x)	2	pint	$6.13	$12.26
Radiant (2x)	16	fl oz	$6.88	$110.00
Lannate LV (2x)	6	pint	$10.88	$65.25
Movento (2X)	10	fl oz	$11.33	$113.28
AZA-Direct	16	fl oz	$1.84	$29.36
M-Pede	1	qt	$15.00	$15.00
Manzate Max (2X)	4.8	qt	$11.25	$54.00
Zing	30	fl oz	$0.73	$21.90
Pristine	16	fl oz	$3.80	$60.80
Chlorine Dioxide (drip lines)	1	gal	$30.00	$30.00
MH30 Sprout Inhibitor	1.33	gal	$24.00	$31.92
Adjuvants (11X)	11	pint	$2.00	$22.00
				$942.92
Custom & Consultants:				
Custom Fertilize	2	ac	$10.00	$20.00
Custom Fumigate - Deep	1	ac	$45.00	$45.00
Hand Weed	1	ac	$120.00	$120.00
Soil Testing	1	ac	$5.00	$5.00
Custom Aerial Application	2	ac	$15.00	$30.00
				$220.00
Irrigation				
Water Assessment	1.00	acre	$66.75	$66.75
Irrigation Fuel pump (diesel)	20.0	gal	$1.27	$25.41
Irrigation Repair (pump)	1.00	ac	$5.00	$5.00
Drip Tape/Supplies	1.00	ac	$250.00	$250.00
Irrigation Set-up/Removal Labor	8.00	hrs	$17.72	$141.79
Drip Tape recycling/haul away	1.00	ac	$10.00	$10.00
Total Irrigation				$498.95
Machinery				
Equipment Fuel	41.67	gal	$ 1.27	$52.92
Road Gas	2.00	gal	$ 2.25	$4.50
Road Diesel	3.00	gal	$ 2.54	$7.62
Repairs	1.00	ac	$ 89.88	$89.88
Lube				$9.76
Hauling charge	786	cwt	$0.35	$275.10
Total Fuel, Lube, Repairs				$439.78
Labor				
Equipment Labor	5.22	hrs	$19.80	$103.44
Irrigation Labor	1.50	hrs	$17.72	$26.59
Sorting/Pickers Labor	2.50	hrs	$13.06	$32.64
Truck Driver Labor	5.00	hrs	$18.22	$91.11
General Labor	3.50	hrs	$16.60	$58.09
Total General, Equipment & Harvest Labor				$311.86
Storage and Packing :				
Bin Rental	786.00	cwt	$1.00	$786.00
Packing	1,414.00	50#	$3.50	$4,949.00
Storage & Packing Subtotal				$5,735.00
Other (Fees and Insurance):				
Crop Insurance	1	ac	$84.00	$84.00
Assessments	786	cwt	$0.05	$39.30
GAP Audit	1	ac	$10.00	$10.00
Subtotal Fees				$133.30
Subtotal Variable Costs				$9,078.13
Interest on Operating Capital				$247.38
Total Operating Costs				$9,325.51

Appendix A (Continued) Cost of Production with Storage and Packing, **Marketable Yields**

Fixed Costs			
Depreciation, Interest, Housing & Insurance On Equipment			**$568.84**
Land	**1.00**	**$316.00**	**$316.00**
Management			**$218.83**
Overhead			**$233.14**
Total Fixed Costs			**$1,336.80**
Total Operating and Fixed Costs			**$10,662.31**
Returns over operating costs			**$781.17**
Returns over Total Costs			**-$555.63**
Operating Cost (Per PAID 50# sack)			**$6.60**
Total Cost (per PAID 50# sack)			**$7.54**
	-		**+**
Price	**5%**	**Paid Yield**	**5%**
Breakeven Yield 50# sack	**1343**	**1414**	**1485**
Operating Cost 50# sack	**$6.94**	**$6.60**	**$6.28**
Ownership Cost 50 # sack	**$1.00**	**$0.95**	**$0.90**
TC	**$7.94**	**$7.54**	**$7.18**
		Price	
Yield	**$6.79**	**$7.15**	**$7.50**
Operating Cost 50# sacks	**1373**	**1305**	**1243**
Ownership Cost 50# sacks	**197**	**187**	**178**
TC	**1570**	**1492**	**1421**

Appendix B. **Field Run** Cost of Production with Storage NO Packing

	Quanity	Unit	Price	$/acre
Field Run Yield	786	cwt	$ 7.11	$5,588.46
Seed				
Seed	0.33	pail	$ 1,794.00	$592.02
Subtotal Seed				$592.02
Fertilizer:				
Dry Nitrogen - Pre-plant	50	lb	$0.51	$25.50
Dry P2O5	115	lb	$0.52	$59.80
Micronutrients/Sulfuric Acid	1	ac	$25.00	$25.00
K20	100	lb	$0.37	$37.00
Liquid Nitrogen	100	lb	$0.57	$57.00
				$204.30
Plant Protection:				
Vapam	40.0	gal	$7.00	$280.00
Select	16.0	fl oz	$0.94	$15.04
Dual Magnum	2.0	pint	$15.63	$31.26
Roundup	22.0	fl oz	$0.16	$3.52
Outlook (2x)	21.0	fl oz	$1.25	$26.25
Buctril	1.5	pint	$7.25	$10.88
Goal Tender (2x)	10.0	fl oz	$1.02	$10.20
Prowl H2O (2x)	2	pint	$6.13	$12.26
Radiant (2x)	16	fl oz	$6.88	$110.00
Lannate LV (2x)	6	pint	$10.88	$65.25
Movento (2X)	10	fl oz	$11.33	$113.28
AZA-Direct	16	fl oz	$1.84	$29.36
M-Pede	1	qt	$15.00	$15.00
Manzate Max (2X)	4.8	qt	$11.25	$54.00
Zing	30	fl oz	$0.73	$21.90
Pristine	16	fl oz	$3.80	$60.80
Chlorine Dioxide (drip lines)	1	gal	$30.00	$30.00
MH30 Sprout Inhibitor	1.33	gal	$24.00	$31.92
Adjuvants (11X)	11.0	pint	$2.00	$22.00
				$942.92
Custom & Consultants:				
Custom Fertilize	2	ac	$10.00	$20.00
Custom Fumigate - Deep	1	ac	$45.00	$45.00
Hand Weed	1	ac	$120.00	$120.00
Soil Testing	1	ac	$5.00	$5.00
Custom Aerial Application	2	ac	$15.00	$30.00
				$220.00
Irrigation				
Water Assessment	1.00	acre	$66.75	$66.75
Irrigation Fuel pump (diesel)	20.0	gal	$1.27	$25.41
Irrigation Repair (pump)	1.00	ac	$5.00	$5.00
Drip Tape/Supplies	1.00	ac	$250.00	$250.00
Irrigation Set-up/Removal Labor	8.00	hrs	$17.72	$141.79
Drip Tape recycling/haul away	1.00	ac	$10.00	$10.00
Total Irrigation				$498.95
Machinery				
Equipment Fuel	41.67	gal	$1.27	$52.92
Road Gas	2.00	gal	$2.25	$4.50
Road Diesel	3.00	gal	$2.54	$7.62
Repairs	1.00	ac	$89.88	$89.88
Lube				$9.76
Hauling charge	786	cwt	$0.35	$275.10
Total Fuel, Lube, Repairs				$439.78
Labor				
Equipment Labor	5.22	hrs	$19.80	$103.44
Irrigation Labor	1.50	hrs	$17.72	$26.59
Sorting/Pickers Labor	2.50	hrs	$13.06	$32.64
Truck Driver Labor	5.00	hrs	$18.22	$91.11
General Labor	3.50	hrs	$16.60	$58.09
Total General, Equipment & Harvest Labor				$311.86
Storage:				
Bin Rental	786.00	cwt	$1.00	$786.00
Storage Subtotal				$786.00
Other (Fees and Insurance):				
Crop Insurance	1	ac	$84.00	$84.00
Assessments	786	cwt	$0.05	$39.30
GAP Audit	1	ac	$10.00	$10.00
Subtotal Fees				$133.30
Subtotal Variable Costs				$4,129.13
Interest on Operating Capital				$112.52
Total Operating Costs				$4,241.65

Appendix B. Continued **Field Run** Cost of Production with Storage NO Packing Charge

Fixed Costs			
Depreciation, Interest, Housing & Insurance On Equipment			**$568.84**
Land	**1.00**	**$316.00**	**$316.00**
Management			**$212.08**
Overhead			**$106.04**
Total Fixed Costs			**$1,202.97**
Total Operating and Fixed Costs			**$5,444.61**
Returns over operating costs			**$1,346.81**
Returns over Total Costs			**$143.85**
Operating Cost (Per Cwt)			**$5.40**
Total Cost (per cwt)			**$6.93**
	-		**+**
Price	**5%**	**Yield**	**5%**
Breakeven	**747**	**786**	**825**
Operating Cost	**$5.68**	**$5.40**	**$5.14**
Ownership Cost	**$1.61**	**$1.53**	**$1.46**
TC	**$7.29**	**$6.93**	**$6.60**
		Price	
Yield	**$6.75**	**$7.11**	**$7.47**
Operating Cost	**628**	**597**	**568**
Ownership Cost	**178**	**169**	**161**
TC	**806**	**766**	**729**