

GROWER GROSS RETURNS - A NEW TOOL FOR COMPARISONS<sup>\*/</sup>by  
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The purpose of this paper is to describe a new computer software program developed at Washington State University that will be of use to the potato industry. This computer program is a model of a potato processing contract. It allows the user to analyze production decisions and estimate, very quickly and easily, the impact that those decisions have on gross income. It does not evaluate the cost side. This program includes base price, all of the usual incentives, allows for early direct delivery payments, and grower storage payments.

Once the basic contract information has been entered into the program, it is very simple to make any income evaluation of interest. Those evaluations can go from very simple, straight forward analyses to complex, multiple adjustment situations. In order to show how this contract program can be utilized by producers, three examples are provided for the reader's information to show how the contract program can be used in evaluating production practices.

The first example deals with bruise free. Assume a situation where there is a 130-acre circle of potatoes with an expected yield of 3,600 tons. Last year, this producer averaged 65 percent bruise free. The question is how much can be spent to achieve 75 percent bruise free potatoes? Assuming the program is set up to represent that person's contract, the returns associated with 75 percent bruise free versus 65 percent bruise free can be evaluated either at the incentive level or the total value of the production coming from that circle. Either approach will result in the same answer in this example.

Table 1 is a replication of the contract screen in the program. It identifies the payment factors in effect. It also shows the values being used to calculate the gross returns. Also listed are the returns per ton for each payable factor and its gross value. Note that the total value is based on 65 percent bruise free. Gross returns from the circle are \$242,287.20.

Table 2 provides the same information, but the returns are based on 75 percent bruise free. The gross value of the circle of potatoes has become \$257,947.20. The difference between the two totals, \$15,660, is the maximum amount that could be spent to improve bruise free 10 percentage points and leave the grower no worse than before.

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Since only one payable factor changed (bruise free percentage) the same result can be obtained by looking at the incentive. With 75 percent bruise free, the value of the incentive in this example is \$31,320 while at 65 percent bruise free, the value of the incentive would be \$15,660. The difference between the two figures which is \$15,660, represents the increase in income associated with improving bruise free from 65 percent to 75 percent on that 130-acre circle of potatoes. Stated in another way, the \$15,660 represents the amount of money the producer could spend to improve his bruise free ten percentage points and be no worse off than before.

Table 1. BRUISE FREE EXAMPLE-- Contract

			<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price		60.00	87,920.00
	Culls	( 8.0 %)	0.10	28.80
	Processing Culls	( 5.0 %)	20.00	3,600.00
	Fumigation Premium		3.00	9,396.00
<u>Storage</u>	Early Direct	August	0.00	0.00
	Storage Payment	( / / )	0.00	0.00
<u>Incentives</u>	Specific Gravity	(1.0810)	3.00	9,396.00
	Bruise Free	(65.0%)	F 5.00	15,660.00
	Size	(38.0%)	F 5.20	16,286.40
	Grade	(82.1%)	F 0.00	0.00
<u>Yield</u>	Useable %	87.0 %		
	Total Tons	3,600.0		
		Useables	\$ 76.20/Ton	
		Field Run	\$ 67.30/Ton	
		Total	\$242,287.20	

Table 2. BRUISE FREE EXAMPLE-- Contract

			<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price		60.00	87,920.00
	Culls	( 8.0 %)	0.10	28.80
	Processing Culls	( 5.0 %)	20.00	3,600.00
	Fumigation Premium		3.00	9,396.00
<u>Storage</u>	Early Direct	August	0.00	0.00
	Storage Payment	( / / )	0.00	0.00
<u>Incentives</u>	Specific Gravity	(1.0810)	3.00	9,396.00
	Bruise Free	(75.0%)	F 10.00	31,320.00
	Size	(38.0%)	F 5.20	16,286.40
	Grade	(82.1%)	F 0.00	0.00
<u>Yield</u>	Useable %	87.0 %		
	Total Tons	3,600.0		
		Useables	\$ 81.20/Ton	
		Field Run	\$ 71.65/Ton	
		Total	\$257,947.20	

This evaluation can also be taken one step farther. Note that we have compared bruise-free percentages that are ten percentage points apart. In this particular case then, given all of the other conditions of the contract, if we divide the difference, \$15,660, by ten, we get the effect on income of each percentage point of bruise-free potatoes from that circle. Each percentage point is worth \$1,566. If the grower felt that five percentage points was a more likely prospect, then he could multiply five times \$1,566 and get the increase in income associated with the five percentage point increase in bruise free which is \$7,830. This is a fairly straight forward example and most individuals probably could do it on paper about as fast as running it through the program.

Let's move to another, slightly more difficult, example that deals with storage. Assume a 3,600 ton storage that last year had 3 percent shrink and the question is how much can be spent to reduce the shrink to 2 percent? What has to be done here is adjust the total volume coming out of the storage for the shrink and then compare the bottom lines. Implicit in this is delivery date. While this example looks at only one date, it should be considered for several dates to be sure of the dollar effect.

Tables 3 and 4 show the bottom line effects of the two shrink levels. With 2 percent shrink, the value of potatoes coming out of storage is \$292,689.94 while at 3 percent shrink, the value of those potatoes out of storage is \$289,703.30. The difference in gross returns to the grower is \$2,986.64. Note that the field run tons used in this example are 98 percent of 3,600 and 97 percent of 3,600. It is the weight coming out rather than going in that determines the payables. In this example, the amount of money that the owner of the storage can afford to spend to reduce shrink from 3 percent to 2 percent is \$2,986.64 or, approximately, \$3,000. The storage example is a bit more difficult than a bruise-free analysis but still fairly straight forward.

Table 3. STORAGE EXAMPLE-- Contract

				<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price			65.00	99,508.44
	Culls	( 8.0 %)		0.10	28.22
	Processing Culls	( 5.0 %)		20.00	3,528.00
	Fumigation Premium			3.00	9,208.08
<u>Storage</u>	Early Direct	August		0.00	0.00
	Storage Payment	(3/16/88)		8.00	24,554.88
<u>Incentives</u>	Specific Gravity	(1.0810)		3.00	9,208.08
	Bruise Free	(75.0%)	F	10.00	30,693.60
	Size	(38.0%)	F	5.20	15,960.67
	Grade	(82.1%)	F	0.00	0.00
<u>Yield</u>	Useable %	87.0 %			
	Total Tons	3,528.0			
		Useables		\$ 94.20/Ton	
		Field Run		\$ 82.96/Ton	
		Total		\$292,689.94	

Table 4. STORAGE EXAMPLE-- Contract

			<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price		65.00	97,472.66
	Culls	( 8.0 %)	0.10	27.94
	Processing Culls	( 5.0 %)	20.00	3,492.00
	Fumigation Premium		3.00	9,114.12
<u>Storage</u>	Early Direct	August	0.00	0.00
	Storage Payment	(03/16/88)	8.00	24,304.32
<u>Incentives</u>	Specific Gravity	(1.0810)	3.00	9,114.12
	Bruise Free	(75.0%)	10.00	30,380.40
	Size	(38.0%)	5.20	15,797.81
	Grade	(82.1%)	0.00	0.00
<u>Yield</u>	Useable %	87.0 %		
	Total Tons	3,492.0		
		Useables	\$ 94.20/Ton	
		Field Run	\$ 82.96/Ton	
		Total	\$289,703.30	

The third example is a little more complicated and requires a changing of two values in the program to get the numbers needed to make the final calculation. Assume that we are trying to decide when to harvest that circle of potatoes mentioned in the first example. We have two harvest dates in mind, an initial date when we estimate yield at 3,600 tons and specific gravity at 1.082. At the second, the later date, we expect yield to be up to 3,640 tons and gravities to be about 1.079. Which harvest date would generate the better returns? The analysis in this case requires that we calculate the bottom line with 3,600 tons and 1.082 gravity and then make another calculation with specific gravity set at 1.079 and yield of 3,640 tons. As shown in Table 5, a yield of 3,600 tons and specific gravity of 1.082 is worth \$261,079.20. The value of the crop if harvest is delayed is \$254,479.68 (Table 6), a difference of \$6,599.52. In this example, the effect of reduced specific gravity on returns is greater than the effect of increased yields. Harvesting at the initial harvest date would generate the better returns.

Table 5. SPECIFIC GRAVITY EXAMPLE -- Contract

			<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price		60.00	87,920.00
	Culls	( 8.0 %)	0.10	28.80
	Processing Culls	( 5.0 %)	20.00	3,600.00
	Fumigation Premium		3.00	9,396.00
<u>Storage</u>	Early Direct	August	0.00	0.00
	Storage Payment	( / / )	0.00	0.00
<u>Incentives</u>	Specific Gravity	(1.0820)	4.00	12,528.00
	Bruise Free	(75.0%)	F 10.00	31,320.00
	Size	(38.0%)	F 5.20	16,286.40
	Grade	(82.1%)	F 0.00	0.00
<u>Yield</u>	Useable %	87.0 %		
	Total Tons	3,600.0		
		Useables	\$ 82.20/Ton	
		Field Run	\$ 72.52/Ton	
		Total	\$261,079.20	

Table 6. SPECIFIC GRAVITY EXAMPLE -- Contract

			<u>\$/Ton</u>	<u>Total \$</u>
<u>Prices</u>	Base Price		60.00	90,008.00
	Culls	( 8.0 %)	0.10	29.12
	Processing Culls	( 5.0 %)	20.00	3,640.00
	Fumigation Premium		3.00	9,500.40
<u>Storage</u>	Early Direct	August	0.00	0.00
	Storage Payment	( / / )	0.00	0.00
<u>Incentives</u>	Specific Gravity	(1.0790)	1.00	3,166.80
	Bruise Free	(75.0%)	F 10.00	31,668.00
	Size	(38.0%)	F 5.20	16,467.36
	Grade	(82.1%)	F 0.00	0.00
<u>Yield</u>	Useable %	87.0 %		
	Total Tons	3,640.0		
		Useables	\$ 79.20/Ton	
		Field Run	\$ 69.91/Ton	
		Total	\$254,479.68	

In all three examples, the numbers utilized do not necessarily reflect the reality of production response. The intent here is to provide examples that show how the program can be used to evaluate production decisions as they relate to grower returns from processing contracts. There are a number of other alternatives, such as evaluating a grower storage contract versus a company storage contract to determine which provides more to the grower who may have the option of choosing one or the other. The program allows people with open potatoes in storage to consider the current value of an opportunity to sell potatoes in storage versus what they think they might be able to get if they hold for several months or sell fresh. The program allows the analysis of any production practice that impacts any or all incentives in effect. In other words, suppose there is some situation where the gravity incentive and the size incentive and total yield are all impacted by a decision. It is easy to make the appropriate changes and immediately have the results.

The purpose of this program is to give producers a tool whereby they can consider the full impact of production practice decisions. Full impact means that not only are the cost effects taken into consideration, but also potential income effects and then, by comparing the change in income to the change in costs, the producer can determine whether or not a particular alternative will generate a negative or positive impact on net returns.