

USE PACKOUTS TO EVALUATE ORCHARD PRACTICES.

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By analyzing packout records, growers can evaluate the economic benefits of various orchard practices.

By Dr. Tom Schotzko¹

Grower packout records, cull analyses reports, and pool closing forms (account sales reports) continue to be the grower's best friend in terms of quantifying what is seen in the orchard with respect to grade, size, and cullage. Further, the pool closing form is the only hard evidence a grower receives that truly reflects what consumers want and are willing to pay. The f.o.b. price is that evidence, or market signal.

As we all know, the prices, costs, and the bottom line (for growers and warehouses) are affected each year by the size and quality of that crop. Because of year to year variability and the longer term adjustments that are occurring in the market, looking at the same information, but averaged over several years, may help growers better evaluate orchard practices.

The Gala and Fuji prices used in the tables are averages by grade and size for the period 1997 to 2001 and are calculated from Washington Growers Clearing House Association data. The increase in Gala production has caused the season average f.o.b., as calculated by the Clearing House, to decline from \$22 in 1996 to \$17 in 2001. There also appears to have been some change in the range of prices by size that affects the bottom line.

A sample pool closing form was used to generate each of the numbers in the tables. Two grades were used for both varieties, Washington Extra Fancy and Washington Fancy. All of the various Washington Extra Fancy categories were included in one Extra Fancy grade. The second grade included Washington Fancy and U.S. Extra Fancy.

The tables show the receipts per acre for different levels of grade, size, cullage and yield. For the Gala table, the size distributions used a peak size of 125 for the small fruit, peak size 113 for medium fruit and peak size 100 for the large category.

While changes may be coming in the volumes of large Fuji sold, recent history suggests using larger peak sizes for Fuji. The Fuji calculations are based

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on sizes 113, 100, and 88. The assessed charges were \$50 per bin and \$4.50 per packed box. Culls were valued at \$50 per ton.

Receipts per acre

These tables show the farm-gate receipts per acre for fruit with alternative characteristics. For example, 30 bins per acre of Gala peaking on size 125 with 70% Washington Extra Fancy and 10% cullage would have brought back to the orchard \$2,613 per acre. The corresponding figure for Fuji would be \$2,447 (recognizing that this return is based on peak size 113).

The effects of yield are estimated using similar rows at different yield levels. For example, 40 bins per acre of large Gala with 80% Extra Fancy fruit and 10% culls returns about \$4,596 per acre. Thirty bins of the same fruit only generate about \$3,447 per acre. The difference of \$1,149 represents the amount of money that could have been spent, including harvest costs to improve yields by ten bins and be no worse off. If, however, the apples are small, an additional ten bins only increases returns \$929 (\$3,716 - \$2,787).

The impact of culls on per-acre receipts comes from comparing two numbers in the same column. At a yield of 40 bins of large fruit with 80% Extra Fancy and 20% culls, per-acre receipts are \$3,985. If the culls are reduced to 10%, the returns increase to \$4,596. Dividing the difference of \$611 by ten gives the economic threshold for that acre. In other words, as long as the cost to reduce cullage one percentage point is less than \$61, it makes economic sense to incur that cost. If the cost is greater than \$61, it does not pay to work on that cull factor.

Economic thresholds vary from one block to another. At 50 bins per acre that same fruit (large, 80% Extra Fancy with 20% versus 10% culls) has an economic threshold of \$76 ($\$5,744 - \$4,981 = \763 and then dividing by 10). Conversely, that threshold for small, poorly colored fruit in low volume (30 bins, 70% Extra Fancy and 20% culls) is only \$36. It just makes good economic sense to put more effort into those blocks that are yielding the best fruit.

The effect of fruit size on returns is shown by comparing numbers in the same row. At 40 bins with 80% Extra Fancy and 10% culls, small Gala produce about \$3,716 per acre. If the peak size is 113 (the middle column), the return is about \$3,984. In that block, improving peak size by one box size increases receipts by \$268 per acre. If peak size increased by two box sizes, the increase in per-acre receipts more than doubles for Gala, to \$880 (at that yield, etc.).

The better indicator of the value of fruit size will be the grower's own pool-closing forms, as these will reflect the marketing strategies being pursued by the sales desk.


The value of fruit size is affected by the size of the crop, destination of the fruit, and the impact of the PLU (Price Look-Up) code. Large crops cause the price spread by size to shrink, sometimes quite significantly. With the recent large crops, size can be less important in determining receipts.

Destination of the fruit can be important. If a warehouse exports large volumes of fruit to Asia, odds are that size is very important in determining price. A review of prices paid for Fuji by destination showed that the export market paid much higher prices for the large fruit than was received from sales in the domestic market.

The other thing that is starting to affect the split in prices by size is the PLU codes used in the supermarkets. Within the PLU code system, large apples are defined as size 88 and larger. Small fruit include size 100 and smaller. That artificial distinction between large and small has created a wider price break between sizes 88 and 100 than is justified by the volumes of fruit within the various size categories.

On average, large fruit continue to reward growers more than small fruit. However, with a shifting market landscape and a lengthening of the list of varieties being produced in volume, the better indicator of the value of fruit size will be the grower's own pool-closing forms, as these will reflect the marketing strategies being pursued by the sales desk.

It is also possible to look at the effect of grade in these tables. For Gala, going from 70% Extra Fancy to 80% Extra Fancy with large fruit, 40 bins per acre, and 10% culls, will increase returns from \$4,288 to \$4,596, a difference of \$308 per acre. It should be noted that with the use of premium labels that occurs today these effects probably understate the grade effect. Obviously, receipts will increase as the proportion of fruit in premium Extra Fancy is increased. The way these numbers were calculated does not take that kind of shift into consideration.

While these numbers can be used to evaluate the economic benefits of orchard practices, they also serve as a reminder that, on average, producing good yields of high quality fruit continues to be profitable. 

IMPACTS OF YIELD, GRADE, SIZE, AND CULLAGE ON GALA RECEIPTS PER ACRE¹				
Yield	Cullage level	Fruit size (\$/acre)		
		Small	Medium	Large
30 bins per acre, 70% Extra Fancy	10	\$2,613	\$2,799	\$3,216
	20	\$2,248	\$2,413	\$2,784
	30	\$1,882	\$2,027	\$2,351
30 bins per acre, 80% Extra Fancy	10	\$2,787	\$2,988	\$3,447
	20	\$2,402	\$2,581	\$2,989
	30	\$2,017	\$2,174	\$2,531
30 bins per acre, 90% Extra Fancy	10	\$2,961	\$3,178	\$3,677
	20	\$2,557	\$2,750	\$3,194
	30	\$2,153	\$2,322	\$2,710
40 bins per acre, 70% Extra Fancy	10	\$3,484	\$3,731	\$4,288
	20	\$2,997	\$3,217	\$3,712
	30	\$2,510	\$2,702	\$3,135
40 bins per acre, 80% Extra Fancy	10	\$3,716	\$3,984	\$4,596
	20	\$3,203	\$3,442	\$3,985
	30	\$2,690	\$2,899	\$3,374
40 bins per acre, 90% Extra Fancy	10	\$3,947	\$4,237	\$4,903
	20	\$3,409	\$3,666	\$4,258
	30	\$2,870	\$3,096	\$3,613
50 bins per acre, 70% Extra Fancy	10	\$4,355	\$4,664	\$5,360
	20	\$3,746	\$4,021	\$4,640
	30	\$3,137	\$3,378	\$3,919
50 bins per acre, 80% Extra Fancy	10	\$4,644	\$4,980	\$5,744
	20	\$4,003	\$4,302	\$4,981
	30	\$3,362	\$3,624	\$4,218
50 bins per acre, 90% Extra Fancy	10	\$4,934	\$5,296	\$6,128
	20	\$4,261	\$4,583	\$5,323
	30	\$3,588	\$3,869	\$4,517

¹Based on 5 year average pieces (1997-2001) by grade and size

IMPACTS OF YIELD, GRADE, SIZE, AND CULLAGE ON FUJI RECEIPTS PER ACRE²				
Yield	Cullage level	Fruit size (\$/acre)		
		Small	Medium	Large
30 bins per acre, 70% Extra Fancy	10	\$2,447	\$3,082	\$3,519
	20	\$2,100	\$2,665	\$3,053
	30	\$1,753	\$2,247	\$2,587
30 bins per acre, 80% Extra Fancy	10	\$2,588	\$3,254	\$3,710
	20	\$2,225	\$2,818	\$3,222
	30	\$1,863	\$2,381	\$2,735
30 bins per acre, 90% Extra Fancy	10	\$2,728	\$3,426	\$3,900
	20	\$2,350	\$2,971	\$3,392
	30	\$1,972	\$2,515	\$2,883
40 bins per acre, 70% Extra Fancy	10	\$3,263	\$4,110	\$4,692
	20	\$2,800	\$3,553	\$4,071
	30	\$2,338	\$2,997	\$3,449
40 bins per acre, 80% Extra Fancy	10	\$3,450	\$4,339	\$4,946
	20	\$2,967	\$3,757	\$4,296
	30	\$2,483	\$3,175	\$3,647
40 bins per acre, 90% Extra Fancy	10	\$3,637	\$4,568	\$5,200
	20	\$3,133	\$3,961	\$4,522
	30	\$2,629	\$3,353	\$3,844
50 bins per acre, 70% Extra Fancy	10	\$4,079	\$5,137	\$5,865
	20	\$3,500	\$4,442	\$5,089
	30	\$2,922	\$3,746	\$4,312
50 bins per acre, 80% Extra Fancy	10	\$4,313	\$5,424	\$6,183
	20	\$3,708	\$4,696	\$5,371
	30	\$3,104	\$3,969	\$4,559
50 bins per acre, 90% Extra Fancy	10	\$4,547	\$5,711	\$6,500
	20	\$3,916	\$4,951	\$5,653
	30	\$3,286	\$4,192	\$4,806

² Based on 5 year average pieces (1997-2001) by grade and size