2018 TAPS Production Economic Strategies and Observations

By: Matt Stockton, Daran Rudnick and Chuck Burr

Introduction

One of the primary reasons for the TAPS program was to provide ample and efficient information about making production and business choices and the associated consequences of those decisions ultimately helping to discover and reveal strategy. While the following discussion is based on real outcomes for the 2018 sprinkler corn competition, it is not intended to evaluate the appropriateness of any particular philosophy, action or strategy. The three production choices included in this discussion are irrigation, nitrogen fertilizer (N) application and corn hybrid. Changes in these three production factors were made to illustrate how varying them alters costs and revenue outcomes resulting in changes of profitability.

A Discussion of Costs

Strategically, costs can be viewed in many different ways. One view of costs might be that the most significant factor or attribute of costs is related to quantity, or price tag value. This is much like what some may view as a Walmart mentality. The price of the item is the most important factor, with little consideration for anything else. To illustrate this point, a farmer purchases a tool, he buys the tool based on price, not worried about its durability and as a result finds it breaking almost immediately upon use. We or someone we know have all used or bought something that was so inexpensively made, and we knew it, that it came as no surprise that it did not last very long. A second view of costs relates to the opposite case where the focus is on quality. This would be like purchasing only established name brands or recognized premium products without consideration of other factors. An extreme example of this would be the purchase of Hanebisho toilet paper costing more than $17 a roll. This toilet paper is supposed to be the finest in the world, but one could question its value in practical use. These two views provide room for a discussion of a third view. This view includes a balance of both quality and quantity attributes. In this third perspective, the focus is on value which requires an evaluation of costs and returns and selecting a strategy based on value for the situation. This idea of value means that quantity and quality are combined and considered in light of accomplishing a specific objective. In farm management this objective is generally purchases that help the business make the most profit. In this paper it is assumed that this third category of costs is logically where most agricultural businesses would want to be. However, due to yield variability, individual bias, unforeseen events, etc., costs, the competitors' choices and actions may appear, at least to outside observers, to be based on something other than value.

The following Table 1 has six columns, the first three are ranked in descending order of costs per acre, from the 2018 irrigated corn farm contest. The second three columns are the same nineteen farms but sorted on a cost per bushel basis. The key identifier is their farm number. While there is no way of knowing the exact strategy or view of costs each of the TAPS competitors had during their participation in the 2018 contest it is interesting to see such a wide variation in costs.

This is especially true since many of the costs were set for the contest and were identical, i.e. land value, equipment and herbicide costs etc. The factors that were variable among competitors relate to the six decision areas of the contest, seed hybrid, seeding populations, crop insurance purchases, irrigation choices, N fertilizer choices and marketing. Costs per acre ranged from $585.32 (Farm 17) to $721.43 (Farm 14), more than a $136/acre difference. One way to think of per acre costs is that it illustrates each team's best efforts to make value purchases based on their strategy and understanding of expected productivity and crop price before the fact. Columns four thru six show a different ranking than the first three. In these columns, Farm 15 has the lowest per unit costs of $2.32/bu with Farm 8 being the highest costs at $2.88/bu. This second set of three columns represent the final outcome of the many choices made during the season considering the actual yields and realized costs.

Table 1

Individual production costs for the 2018 growing season by Farm #, ranked from lowest costs to highest costs on a per acre basis and then on a per bushel basis

	Ranked Total Costs/acre			Ranked Total Costs/bu	
Farm #	**$/acre**	**$/bu**	**Farm #**	**$/acre**	**$/bu**
17	585.32	2.64	15	648.39	2.32
6	630.17	2.70	7	711.56	2.47
15	648.39	2.32	13	649.16	2.52
13	649.16	2.52	20	691.6	2.54
19	659.46	2.57	9	689.14	2.55
11	673.51	2.62	19	659.46	2.57
2	680.96	2.67	10	707.23	2.59
4	682.48	2.74	1	716.25	2.61
3	686.39	2.62	11	673.51	2.62
9	689.14	2.55	3	686.39	2.62
16	691.21	2.88	17	585.32	2.64
20	691.6	2.54	18	700.36	2.65
8	694.21	2.89	2	680.96	2.67
5	695.95	2.82	6	630.17	2.70
18	700.36	2.65	4	682.48	2.74
10	707.23	2.59	14	721.43	2.77
7	711.56	2.47	5	695.95	2.82
1	716.25	2.61	16	691.21	2.88
14	721.43	2.77	8	694.21	2.89
Average	679.73	2.64		679.73	2.64

The first three columns are reflective of the competitors' best efforts to make choices that would result in what they thought would produce the most profit. The second three columns of Table 1, per bushel costs are the realization of those costs choices how close they came in achieving the most profit in the absence of any marketing effect, where all produced corn has the same value, this is known as the naive profit. Table 2 shows the naive profit rankings of the nineteen farms. The top rank per acre farm in the first three columns, Farm 17, drops to 11th best in naïve profit. This change in ranking is a direct result of productivity differences among the farms. Interestingly the 17th ranked costs per acre farm, Farm 7, with the third highest cost per acre, but due to productivity was ranked second best in costs/bu and naïve profit. Looking at Table 2 it becomes obvious that low cost per bushel is only partially correlated to profitability but it is not the driving factor since productivity also plays a role. It is the effectiveness of the input costs in production that make the difference.

Table 2. Competing farms ranked by potential profit, where profit is based on the difference between bushel costs and $3.20 bu.

Naïve Profit Rank	Costs/Acre Rank	Farm#	Margin $/bu	Profit $/acre
1	3	15	0.88	244.09
2	17	7	0.73	211.64
3	12	20	0.66	178.48
4	4	13	0.68	175.48
5	10	9	0.65	174.86
6	16	10	0.61	167.97
7	18	1	0.59	163.11
8	5	19	0.63	161.02
9	9	3	0.58	152.33
10	6	11	0.58	150.17
11	15	18	0.55	144.76
12	7	2	0.53	136.64
13	1	17	0.56	125.40
14	2	6	0.50	117.03
15	8	4	0.46	114.32
16	19	14	0.43	113.13
17	14	5	0.38	94.13
18	11	16	0.32	77.11
19	13	8	0.31	75.71
		Average	0.56	146.18

Notably, Farm 20 is ranked lower than Farm 13 in cost per bushel (Table1 and Table 2 column 2), also noted by the lower margin value in Table 2 column 4, but has a greater profit per acre as seen in column 5 of that table. This same relationship also holds true for Farms 10 verses farm 19, as well as for farm 2 compared to 17 and farm 18 compared to farm 17. These farms, 20, 10, 2, 18 have lower margins per bushel and higher profits per acre than some of the other farms. This illustrates the productivity effect on profitability. The difference between bushel costs and price received (margin) is a measure of dollar efficiency and represents profit per bushel not overall profitability. To reinforce this idea several examples are given. First let’s use the estimated water relationship. For our purposes water efficiency is defined as that point where the least amount of water has the greatest response on yield. Using at the 2018 data it was estimated that the first acre inch of irrigation during the 2018 growing season contributed about 10.74 bu/acre of grain to production. The second acre inch contributed about 8.98 bu/acre, the third inch produced an additional 7.23 bu/acre. The trend continues with the fourth, fifth and sixth inches contributing 5.48 bu/acre, 3.73 bu/acre and 1.97 bu/acre respectively. Given this relationship the most efficient use of water would be to apply only the first inch. However, doing that reduces productivity and leaves a great deal of profit unrealized. Illustrating the point that the highest efficiency does not necessarily lead to the most profitability. This fact demonstrates the value of optimizing profits verses being purely efficient. This is also why market prices and costs need to be considered in the optimizing process. The key to maximizing profit for the whole farm requires focusing on each acres total contribution to it. It is helpful to consider the relationship between both revenues and costs. Revenue is primarily a product of corn price and corn grain yield. The relevant costs for this example are those that contribute to productivity. Profit is the difference between revenue and costs. This difference is quantity sensitive, the volume of production alter total profits. This being the case, a higher yield per acre can compensate for lower margins and vis versa. A $1.00/bu margin (revenue minus costs) on 60 bu/acre production would provide a $60.00/acre profit which is exceeded by a $0.75/bu margin given an 85 bushel per acre yield ($63.75/acre). However, if yields were slightly lower in the second case by 5 bushels, 80 bushels per acre production, the profit between the two margins would be even at $60.00/acre. This illustrates the relationship between productivity, price and costs. These very facts illustrate why making correct cost choices are so difficult to make, but are so important. It also demonstrates why sales price (grain value) is vital to consider in making costs choices.

Decision Results

Three of the six TAPS choices were found to affect productivity in a significant way; N fertilization, irrigation and corn hybrid. The seed population decisions are hybrid specific and are included as part of the hybrid choice. Each of these three choice types will be considered individually in the next portion of this article. The remaining two contest decisions, crop insurance rate and marketing, are significant in determining profit but are not production input choices. While buying crop insurance is an expense and reduces risk and may increase the flexibility of the purchaser in developing a marketing strategy and plan and even assure the operations existence it does not directly alter productivity. A discussion of it is left for another time. The marketing decisions are by themselves major players in determining profitability. Great marketing can potentially make up for poor and/or high production costs, conversely poor marketing can negate high production and/or low production costs, making this decision type key in an operations quest for business success.

The N fertilizer Decision

Table 3 shows the effect of applying the expected maximum effective rate of N, 200 lb/acre, for each of the competing farms. Column 2 lists the change in N fertilizer needed to make individual farm adjustments. Column 3 indicates the change in yield as a result of changing the amount of total N fertilizer applied. Column 4 is the observed yield before any adjustment to N fertilizer has been made. Column 5 is the model predicted production based on the addition or reduction of applied N. Seven of the nineteen farms would have had no change or reduction in N levels to meet the benchmark application rate. Those farms that required no change in N were farms 2, 7 and 20 and would be unaffected in costs or yields. Farms that would have benefited by a reduction in N application were 1, 4, 8, and 9 which would average 13.75 lb of N/acre less. These four farms were predicted to have no yield changes with the benefit of a costs savings. The remaining twelve farms needed increased N to meet the ideal rate. These twelve farms on average would have needed 26.25 lb of N/acre. This increased fertilization is expected to increase grain yield by an average 14.93 bu/acre. The individual farm changes in both N and yield are listed in Table 3 Column 2 and 3. Each of the sixteen farms that needed a change in N rate benefited by either a costs savings or a productivity increase. In all instances where a productivity increase occurred its value exceeded costs. Seven of the twelve farms with expected N fertilizer increases would have exceeded 20 lb of additional N/acre. Of these seven farms three 13, 16, and 17 would have needed at least 45 lb of additional N/acre. The average value of the additional yield minus its costs for these three farms was $0.26/bu, a substantial increase in net return or gain (Table 4 column 5).

Table 3. Estimated yield changes from the addition or reduction of N fertilizer. Negative values of added N indicate a reduction in N fertilizer. Yields were unaffected by the reduction in N application down to the 200 lb/acre level

Farm #	Added lbs of N/acre	Change in bu/acre	Current bu/acre	Projected bu/acre
1	-10	0.0	274.6	274.6
2	0	0.0	255.3	255.3
3	10	5.7	262.0	267.7
4	-15	0.0	248.6	248.6
5	20	11.4	246.6	258.0
6	35	19.9	233.6	253.5
7	0	0.0	288.3	288.3
8	-5	0.0	240.3	240.3
9	-25	0.0	270.0	270.0
10	5	2.8	273.6	276.4
11	20	11.4	257.3	268.7
13	60	34.1	257.6	291.7
14	10	5.7	260.6	266.3
15	5	2.8	279.0	281.8
16	45	25.6	240.0	265.6
17	70	39.8	222.3	262.1
18	25	14.2	264.3	278.5
19	10	5.7	256.6	262.3
20	0	0	272.0	272.0
Average Additions	26.25	14.93		
Average Reductions	-13.75	0.00		

All sixteen farms that needed an increase or decrease of applied N to reach the benchmark level were predicted to have a decline in per bushel costs. While costs per bushel declined in twelve of the farms costs/acre increased. The average increase of these twelve farms for N fertilizer was $8.40/acre per farm (Table 4 column 2). The twelve farms with cost/acre increases were farms 3, 5, 6, 10, 11, 13, 14, 15, 16, 17, 18 and 19. These farms were also expected to have yield increases resulting in an average per bushel net return or gain of $0.12/bu (Table 4, Column 5, second to last row). The remaining four affected farms 1, 4, 8 and 9 would have applied less N without any yield decrease which would lower both per acre and per bushel costs and increase net returns on average by $0.02/bu (Table 4 Column 5, bottom row). Farms 3, 7, and 20 were unaffected in costs or productivity, since they had applied the optimal level of N fertilizer.

Table 4. Estimated costs changes from the changes in N levels. Negative values indicate a reduction in costs created by lower levels of applied N. The Net Gain is the costs difference between Before and After changes in N levels.

Farm #	Change in Costs $/acre	Costs Before Change ($/bu)	Costs After Change ($/bu)	Net Gain $/bu
1	-3.20	2.61	2.59	0.01
2	0.00	2.67	2.67	0.00
3	3.20	2.62	2.58	0.04
4	-4.80	2.74	2.72	0.02
5	6.40	2.82	2.72	0.10
6	11.20	2.70	2.53	0.17
7	0.00	2.47	2.47	0.00
8	-1.60	2.89	2.88	0.01
9	-8.00	2.55	2.52	0.03
10	1.60	2.59	2.57	0.02
11	6.40	2.62	2.53	0.09
13	19.20	2.52	2.29	0.23
14	3.20	2.77	2.72	0.05
15	1.60	2.32	2.31	0.02
16	14.40	2.88	2.66	0.22
17	22.40	2.64	2.32	0.32
18	8.00	2.65	2.55	0.11
19	3.20	2.57	2.53	0.04
20	0.00	2.54	2.54	0.00
Average Addition	8.40	2.64	2.52	0.12
Average Reduction	-4.40	2.70	2.68	0.02

The Irrigation Decision

Irrigation water is measured in inches per acre (in/acre). The estimated biologically optimal level of irrigation for 2018 was 6.62 in/acre. The economic optimal level was 1.46 in/acre less, 5.16

in/acre. Only five of the nineteen farms applied less than the economically predicted optimal amount of irrigation, farms 6, 14, 15, 17,and 19 (Table 5, Column 2). Farm 17 was the only competitor that would have added more than 1 in/acre of irrigation to reach the economically optimal level. This farm was predicted to increase yields by 25.4 bu/acre by adding 4.11 in/acre of water. The remaining four farm needed between .11 in/acre to .61 in/acre with predicted gains in production of .3 bu/acre to 1.9 bu/acre (Table 5, Columns' 1, 2, and 3).

Table 5. Estimated yield changes from the addition or subtraction of irrigation water. Negative values of added irrigation indicate a reduction in water application. Yields were unaffected by the reduction of water up to 5.16 in/acre

Farm #	Needed Water to Reach Optimum in/acre	Change in bu/acre	Current bu/acre	Projected bu/acre
1	-6.54	0	274.6	274.6
2	-2.79	0	255.3	255.3
3	-3.99	0	262	262
4	-0.44	0	248.6	248.6
5	-3.79	0	246.6	246.6
6	0.11	0.3	233.6	233.9
7	-4.44	0	288.3	288.3
8	-0.84	0	240.3	240.3
9	-1.44	0	270	270
10	-2.99	0	273.6	273.6
11	-1.39	0	257.3	257.3
13	-1.04	0	257.6	257.6
14	0.61	1.9	260.6	262.5
15	0.46	1.4	279	280.4
16	-3.94	0	240	240
17	4.11	25.4	222.3	247.7
18	-4.49	0	264.3	264.3
19	0.21	0.6	256.6	257.2
20	-0.14	0	272	272
Average Additions	1.10	5.92		
Average Reductions	1.72	0.0		

Fourteen farms were predicted to need a reduction in water with no change in yield. (Table 5, Column's 2, and 3). These farms were farms 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 16, 18, and 20. Each of these farms except farm 20 had a net gain in profit of at least $0.01/bu with an average gain of $0.09/bu profit for all fourteen. Farms that would have benefited the most from a reduction in irrigation where farms 1, 2, 3, 5, 7, 10, 16 and 18 which on average have a cost reduction of

$0.09/bu or more by using less water. Farm 1 was projected to have the most savings of $0.20/bu. This cost savings would have been $53.84/acre with a water savings of 6.54 in/acre. The biological optimum is not the most profitable. This is due to the fact that with each added inch of irrigation waqs predicted to result in a diminished amount of productivity (yield). The difference between the 6.62 in/acre (biological optimum) versus the economic optimum of 5.16 is 1.46 in/acre of applied irrigation with a cost difference of $12.04/acre. The estimated increase in yield due to the added irrigation is 1.89 bu/acre valued at $6.04. It is obvious that the added water cost is almost double the value of the extra grain produced which would reduce profit by $6.00/acre. From these calculations it is easy to see why it is important to know the productivity of the next added inch of irrigation and the value of the added production.

Table 6. Estimated costs changes from the changes in irrigation water applied in inches per acre (in/acre). Negative values indicate a reduction in costs created by lower levels of applied water. The Net Gain is the costs difference between Before and After changes in irrigation levels.

Farm #	Change in Costs $/acre	Cost Before Change $/bu	Cost After Change $/bu	Net Gain $/bu
1	-53.84	2.61	2.41	0.20
2	-22.98	2.67	2.58	0.09
3	-32.86	2.62	2.49	0.13
4	-3.64	2.74	2.73	0.01
5	-31.21	2.82	2.69	0.13
6	0.89	2.70	2.70	0.00
7	-36.56	2.47	2.34	0.13
8	-6.93	2.89	2.86	0.03
9	-11.87	2.55	2.51	0.04
10	-24.63	2.59	2.50	0.09
11	-11.46	2.62	2.57	0.04
13	-8.58	2.52	2.49	0.03
14	5.00	2.77	2.77	0.00
15	3.77	2.32	2.33	0.00
16	-32.44	2.88	2.74	0.14
17	33.81	2.64	2.50	0.13
18	-36.97	2.65	2.51	0.14
19	1.71	2.57	2.57	0.00
20	-1.17	2.54	2.54	0.00
Average Additions	10.35	2.67	2.64	0.03
Average Reductions	-22.51	2.66	2.57	0.09

Hybrid Selection Decision

Before the data was analyzed it was thought that hybrid would probably not make that much of a difference in the economic outcome. However, at least for the 2018 year the varieties of corn used in the contest made some real differences in productivity and costs. It was estimated that the variety change would have had the largest overall average impact on the various farms costs and net gain verses irrigation or fertilizer changes. Table 7 shows the observed contest yield results (column 2) by farm number (column 1), with column 3 listing the projected yields using the base A1 hybrid. The different hybrids, B varieties, are listed in column 4. The A1 variety was grown by farms 1, 12, 13, 17 and 18. Note that farm 12 is not listed with any of the results since it was a study farm and was not part of the competition. The farms planting the A1 variety are highlighted with yellow for easy identification. The B1 – B11 varieties are those hybrid's planted by farms 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 19, and 20. For all B variety farms except Farm 7 there was a forecasted improvement in yield when planted to variety A1. The average improvement per farm was 22.6 bu/acre with the most improved being Farm 8 with an estimated 47.4 bu/acre yield increase when planting variety A1.

Table 7. Estimated yield changes from TIPS From Taps 1 article. The B variety is the actual yields by farm number. Variety A is the estimated yields if Dekalb 60-69 had been used with the same water and fertilizer levels. Farms 1, 13, 17 and 18 were not estimated since no change was expected being the same variety.

Farm #	Actual (Variety B) Yields	Expected (Variety A) Yields	Hybrid Corn Seed Variety	Yield Difference Bu/Acre
1	274.8	274.8	A1	0
2	255.5	288.0	B1	32.5
3	262.1	282.3	B2	20.2
4	249	288.0	B3	39.0
5	246.9	276.6	B4	29.7
6	233.5	267.8	B5	34.3
7	288.5	288.0	B6	-0.5
8	240.6	288.0	B2	47.4
9	270	288.0	B4	18.0
10	273.5	285.2	B7	11.7
11	257.4	276.6	B8	19.2
13	257.7	257.7	A1	0
14	260.8	280.4	B5	19.6
15	278.9	283.8	B9	4.9
16	240.1	262.4	B10	22.3
17	222.1	222.1	A1	0
18	264.1	264.1	A1	0
19	256.4	281.7	B2	25.3
20	271.9	288.0	B11	16.1

Of the fifteen farms that would have a variety change five farms 2, 5, 6, 14 and 15 were projected to have a per acre cost increase while the remaining ten farms 3, 4, 7, 8, 9, 10, 11, 16, 19 and 20 would have a decrease in expense. The projected average seed cost increase for the five farms was $14.56/acre with the ten farms predicted to have an average cost savings of $9.97/acre. However the revenue from the yield improvements dominated the added seed expense for the five farms with costs increases. Nine of the ten farms with a cost savings, were predicted to also have an increase in revenue due to higher levels of productivity. This fact indicates these farms would have benefited in cutting costs and increasing revenue simultaneously making the variety switch for these nine farms an ideal choice for increasing profitability, a win-win outcome. Farm 8 benefited the most from the hybrid change with $151.68/acre increase in revenue from yield and a $6.99/acre reduction in seed costs with a total net benefit of $158.57/acre or a net gain of $0.50/bu. The tenth farm with a seed cost decrease, farm 7, was the only competitor that was predicted to have a reduction in yield, 0.5 bu/acre due to the hybrid switch. This yield change would decrease revenue, albeit small, $1.60/acre. The revenue reduction would have been outweighed by a substantial seed cost savings of $23.06/acre. The switch would net farm 7 $21.46/acre and create a net gain of $0.08/bu.

Table 8. Estimated yield affects due to variety change. The change in costs is difference in planting costs between the panted variety B and the new variety A. Variety A is the estimated yields using the same water and fertilizer levels observed. The cost savings and revenue changes can be attributed solely to variety difference.

Farm #	Change in Costs $/acre	Cost Before Change $/bu	Cost After Change $/bu	Net Gain $/bu
1	0.00	2.61	2.61	0.00
2	22.60	2.67	2.44	0.22
3	-10.14	2.62	2.40	0.22
4	-1.38	2.74	2.36	0.38
5	2.60	2.82	2.53	0.29
6	19.61	2.70	2.43	0.27
7	-23.06	2.47	2.39	0.08
8	-6.99	2.89	2.39	0.50
9	-4.14	2.55	2.38	0.17
10	-2.87	2.59	2.47	0.12
11	-6.40	2.62	2.41	0.20
13	0.00	2.52	2.52	0.00
14	25.56	2.77	2.66	0.10
15	2.44	2.32	2.29	0.03
16	-2.24	2.88	2.63	0.25
17	0.00	2.64	2.64	0.00
18	0.00	2.65	2.65	0.00
19	-10.14	2.57	2.30	0.27
20	-32.31	2.54	2.29	0.25
Average Additions	14.56	2.66	2.47	0.18
Average Reductions	-9.97	2.65	2.40	0.24

Summary

In this simple three costs factor analysis it was found that every farm could have increased profit by making alternative available choices. For this competition year, these choices would either increase productivity more than the added costs or simply decrease costs. Interestingly, the N decision was dominated by under application of N with only four farms applying more than the 200 lb of N/acre. Farm 17 would have benefited most from added N application. Please remember that N was not modeled here as having a fading effect making the point that knowing the true relationship of N fertilization to productivity potentially effects both the direct per acre costs and consequently alters the per bushel costs and per acre revenue. Farm 1 would have benefited the most from an irrigation decrease, over applying more than 6 in/acre of water at a cost of $53.84/acre. Farm 17 was the only farm that would have had a significant increase in yield (25.4 bu/acre) from an increase of 4.11 in/acre of irrigation. All of the other farms either needed very small amounts of added irrigation or over applied water. More farms over applied water than under applied it. Eleven of the nineteen farms over applied water by at least 1 in/acre. The average cost reduction for farms needing to decrease water applications would have resulted in a $0.09/bu savings, with hundreds of thousands of bushels produced on a large farm that translates into tens of thousands of dollars in costs savings. The ideal amount of irrigation of course vary by year, location and crop. The variety selection decision had the most unexpected results. While there are plenty of ideas about how to select from the many varieties of corn to culture, work needs to be done to find those approaches that lead to successful selections. What is evident, at least for the 2018 season, is that varieties vary considerably in their performance and those differences are not trivial. Farm 8 benefited the most from the simulated change in variety of any farm mostly due to the productivity increase, which was greater than any other farm and the small seed costs savings. Farm 20 was predicted to have the largest seed cost savings of $32.31/acre from switching varieties.

From these three production decisions it is apparent that the combination of cost changes and yield changes have important inter-relationships and are at the heart of making, “good“, economic choices. From this analysis it becomes abundantly clear that the modern farm business is production and productivity driven. However, while productivity lies at the foundation of having a successful farm business, without cost control and the consideration of its relationship to productivity and productivity’s relationship to revenue, optimal profits are likely to be left unclaimed or unachievable. Productivity, as seen here from the diverse outcomes, is not independent of costs and profits most definitely are chained to both costs and revenue. Add to this the effect of marketing and it is no wonder that farm’s vary considerably in their profitability and financial solvency. The marketing decision on its own can potentially alter profitability and relates directly to revenue and indirectly to costs decisions. From what we have seen here, poor marketing, lower prices puts pressure on costs making the decision that much more critical and difficult. While higher prices received, better marketing, creates at least to some degree more wiggle room to make less risky production decisions.