



Differences Between High-, Medium-, and Low-Profit Producers: An Analysis of 2011-2013 Kansas Farm Management Association Crop Enterprises

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Because of its importance at the individual farm level and at the policy-making level, farm profitability is a topic widely discussed in both the agricultural community and in Washington D.C. Uncontrollable macroeconomic factors such as interest rates, trade policies, and government programs/policies impact overall farm profitability. In addition to macroeconomic factors, weather can have a big impact on farm profitability – a factor all too many Kansas producers are very aware of in recent years. However, individual producers do have some control of profitability at the farm level relative to other producers. That is, while numerous factors beyond the producer's control impact the absolute level of profitability, producers' management abilities impact their relative profitability. In a competitive, consolidating industry such as agriculture, relative profitability dictates which producers remain in business in the long run.

For long-term business sustainability it is important to recognize which management and farm characteristics determine relative farm profitability among producers. Do profitable farms get higher yields? Do profitable farms receive higher prices for their commodities? Do they have lower costs? If they have lower costs, in what areas are their costs lower? To consider these questions, crop enterprise budgets from the Kansas Farm Management Association (KFMA) Enterprise Analysis for the years 2011-2013 were divided into three profitability groups, high, middle, and low, based on the 3-year average per acre return to management.¹ The enterprises (number of farms) included in this analysis were alfalfa (34), corn (88), irrigated corn (33), grain sorghum (76), full-season soybean (102), double-crop soybean (31), and wheat (139).

Enterprise analyses completed at the regional level (NW, SW, NC, SC, NE, and SE) were aggregated for the entire state for this analysis. Enterprises also were aggregated by tillage method where applicable – i.e., no-till enterprises were analyzed jointly with those including tillage (same was done for center pivot and flood irrigation in the case of irrigated corn). For a farm to be included in a specific enterprise analysis, KFMA must have had data for that enterprise each year over the 3-year period. Producer returns over a multi-year period better characterize profitability differences due to management abilities than would returns from a single year, which would be expected to be more random due to uncontrollable events (e.g., weather).² However,

¹ The words profitability and profit used in this paper refer to the Net Return to Management measure reported in the Kansas Farm Management Association Enterprise *PROFITCENTER* Summary reports. Net Return to Management is gross income less all costs, which includes unpaid labor, depreciation, and a charge for owned land.

² A 5-year average (2009-2013) was also examined as this reduces the impact of random weather effects that might exist with a shorter time period. However, the number of farms available for analysis would have decreased considerably – alfalfa (27), corn (58), irrigated corn (27), grain sorghum (59), full-season soybean (80), double-crop soybean (27), and wheat (108). Thus, it was determined to report the results for the analysis on the larger sample size (results were generally consistent with 5-year averages).

even with this approach to smooth across weather events, likely the returns are influenced somewhat due to weather given the extreme variability experience across the state over this time period (e.g., there was tremendous variability in wheat yields in 2013 from west to east in wheat yields due to weather conditions).

Aggregation of a number of the income and expense categories reported in the KFMA enterprise reports allows for easier comparisons. Crop income was calculated for each farm-year by multiplying the yield by the operator percentage and the commodity price. Gross income included crop income plus any government payments, crop insurance payments, and any other type of miscellaneous income directly related to the production of the specific crop. Machinery costs were the summation of general machinery repairs, machinery hire net of custom work, fuel, gas, oil, market depreciation, and machinery-related labor costs. Other costs were the summation of fees, grain storage and marketing, personal property tax, general farm insurance, utility expense, conservation, and auto-expense. Land costs were the summation of cash rent, real estate taxes, and an opportunity cost on owned land (calculated based on a percentage of the crop times an average market price).

The following is a brief discussion of the analysis for each of the different enterprises included. It is important to recognize that in some cases these analyses are based on relatively small samples (e.g., alfalfa, irrigated corn, and double-crop soybean) and thus that should be considered when reviewing results. Nonetheless, it is believed that analyzing these data still can provide some useful information as to profitability differences.

Non-irrigated Corn (Table 1)

On average, high-profit farms earned \$149.62 per acre more profit than the low-profit farms and \$75.13 per acre more than the mid-profit farms. Prices were similar for high- and mid-profit farms and slightly lower for low-profit farms (\$5.89 and \$5.87 versus \$5.76) and averaged \$5.84 per bushel across all farms. Yields were relatively low for all three groups, but followed the same pattern as profit groupings, i.e., high-profit farms had the highest yield and low-profit farms had the lowest yield. All three profit groups had a substantial part of their income from crop insurance (averaged almost \$110 per acre for all three groups). Gross income was \$144.43 per acre higher for the high-profit farms compared to the low-profit farms. Mid-profit farms had \$52.49 per acre lower gross income than high-profit farms. Total costs were relatively consistent across the three groups, ranging from a low of \$422.38 (high-profit farms) to a high of \$445.03 (mid-profit farms). The difference between the high- and low-profit farms was only \$5.20 per acre. The two biggest cost differences between the high- and low-profit farms were machinery and land. High-profit farms had \$18.35 per acre lower machinery costs, but \$23.21 per acre higher land costs. The mid-profit farms had the highest costs of the three groups.

Because the high- and low-profit farms had similar costs, almost all of the profit difference between these two groups was due to income differences (96.5% of difference due to income and 3.5% due to costs). Crop income can vary due to yield, price, and operator percentage. Comparing the high- versus low-profit farms most of the difference is due to yield and the least amount is due to price. Higher operator percentages are an indication of either owned or cash rented land and thus we would expect higher land costs in this situation. The high- and mid-profit farms have comparable operator percentages (89.0% and 88.8%) and they have similar land costs. The low-profit farms have a lower operator percentage (82.3%) and a comparably lower land cost (i.e., they give up some of the bushels in lieu of paying rent). High-profit farms had the highest acreage with

596 acres, low-profit farms were second with 554 acres, and mid-profit farms were third with 367 acres. Thus, high-profit farms had 8% more acres (596 versus 554) than low-profit farms and 63% more acres (596 versus 367) than mid-profit farms. Of the 88 farms, 44 were classified as no-till operations. These 44 no-till operations were spread over the high-, mid-, and low-profit categories as 13, 16, and 15, respectively, indicating no-till was not a major determinant of profit ranking. However, because this is comparing farms across the entire state it is important to recognize that this should not be viewed as a “no-till versus tillage” analysis. The majority of the 88 farms were from the NC, NE, NW, and SE regions (none from SW and only 3 from SC). Region did not appear to have a significant impact on profitability (i.e., farms for the various regions were distributed fairly evenly across all three profit categories). There was a slight tendency for a higher percent of farms from SE to fall in the low-profit group, but this is not a strong result given the sample size.

In summary, high-profit farms had significantly higher gross income than low-profit farms and slightly lower costs leading to a 3-year average difference in returns of \$149.62 per acre. Because of the years analyzed, average yields were quite low and crop insurance payments reflected a large portion of income. The primary driver of the difference in returns is income, as opposed to costs, and more specifically yield differences and not price differences. The average return to management for all farms across this 3-year period was -\$1.84 per acre, but the top third of farms earned a positive \$73.08 per acre. The average for the mid- and low-profit farms were both negative over the 3-year period at -\$2.05 and -\$76.54 per acre. Figure 1a contains a breakdown of prices and yields for the three profitability groups and Figure 1b presents a similar breakdown of each group's costs.

Irrigated Corn (Table 2)

High-profit farms earned an average of \$334.73 per acre more profit than the low-profit farms and \$191.69 per acre more than the mid-profit farms. Prices were similar for high- and mid-profit farms and lower for low-profit farms (\$6.04 and \$6.00 versus \$5.66) and averaged \$5.90 per bushel across all farms. Yields were highest for high-profit farms and lowest for low-profit farms. The mid-profit farms had considerably higher yields than the low-profit farms (145.1 versus 113.1 bu per acre), but they also collected over \$14/ac higher crop insurance indemnity payments. High-profit farms had fairly lower crop insurance payments due to their much higher yields of 180.1 bu per acre. Gross income was \$442.14 per acre higher for the high-profit farms compared to the low-profit farms. Mid-profit farms had \$266.59 per acre higher gross income than low-profit farms. In spite of having considerably higher yields, the high-profit farms did not have the highest average total costs. Total costs for the high-profit farms were \$107.42 higher than low-profit farms, but they were actually \$16.13 less than the mid-profit farms. High-profit farms had higher costs than low-profit farms in most all categories (slightly lower crop insurance costs).

Because the high-profit farms had considerably higher costs than the low-profit farms, all of the profit difference between these two groups was due to income differences. Breaking down the crop income difference into the yield, price, and operator % components reveals that 63% of the crop income difference is due to yield, 28% due to operator % and 9% to price. High-profit farms had the highest operator percentage (owned and cash rented land) and the low-profit farms had the lowest operator percentage (more crop share rented land). High-profit farms had the highest acreage with 826 acres, low- and mid-profit farms were essentially the same size with 378 and 379 acres, respectively. Thus, high-profit farms had approximately 118% more acres than both the low- and mid-profit farms. The majority of the 33 farms (27) were from the NC and NW regions

with the rest in SC, SW, and NE (none from SE). Farms in the NW region tended to be in the high- and mid-profit categories and farms in the NC region tended to be in the low-profit category indicating a potential regional impact on profitability over this 3-year time period.

In summary, high-profit farms had significantly higher gross income (+64%) than low-profit farms which more than made up for their 16% higher costs leading to a 3-year average difference in returns of \$334.73 per acre. The driver of the difference in returns is income, as opposed to costs, and more specifically yield differences and operator percentage and not price differences. The average return to management for all farms across this 3-year period was \$177.63, which is extremely good, but the average for the low-profit farms at \$18.38 was only slightly better than breakeven. Figure 2a contains a breakdown of prices and yields for the three profitability groups and Figure 2b presents a similar breakdown of each group's costs.

Non-irrigated Grain Sorghum (Table 3)

High-profit farms earned an average of \$134.30 per acre more profit than the low-profit farms and \$72.38 per acre more than the mid-profit farms. Prices averaged \$5.58 per bushel across all farms and were similar for the three profit groups. Yields were relatively low for all three groups, but followed the same pattern as profit groupings, i.e., high-profit farm had the highest yield and low-profit farms had the lowest yield. All three profit groups had a substantial part of their income from crop insurance (averaged almost \$52 per acre for all three groups). Low-profit farms had the lowest average crop insurance payment and the lowest average yield. Gross income was \$123.40 per acre higher for the high-profit farms compared to the low-profit farms. Mid-profit farms had \$79.80 per acre lower gross income than high-profit farms. Total costs were relatively consistent across the three groups, ranging from a low of \$305.66 (mid-profit farms) to a high of \$323.97 (low-profit farms). The difference between the high- and low-profit farms was only \$10.89 per acre. The two biggest cost differences between the high- and low-profit farms were machinery and land. High-profit farms had \$24.80 per acre lower machinery costs, but \$15.14 per acre higher land costs. The mid-profit farms had the lowest costs of the three groups.

Because the high- and low-profit farms had similar costs, almost all of the profit difference between these two groups was due to income differences (91.9% of difference due to income and 8.1% due to costs). Crop income (excluding government payments and crop insurance) can vary due to yield, price, and operator percentage. Comparing the high- versus low-profit farms most of the difference is due to yield and operator percentage and essentially none is due to price. Higher operator percentages are an indication of either owned or cash rented land and thus we would expect higher land costs in this situation. The high-profit farms have the highest operator percentage and they do have they have the highest land costs. The mid- and low-profit farms have similar land costs even though the mid-profit farms have a slightly higher operator percentage. High-profit farms had the highest acreage with 463 acres, mid-profit farms were second with 440 acres, and low-profit farms were third with 270 acres. Thus, high-profit farms had 5% more acres (463 versus 440) than mid-profit farms and 71% more acres (463 versus 270) than low-profit farms. Of the 76 farms, 41 were classified as no-till operations. These 41 no-till operations were spread over the high-, mid-, and low-profit categories as 19, 13, and 9, respectively, suggesting no-till farms tend to be in the high-profit category more often than in the low-profit category. However, because this is comparing farms across the entire state it is important to recognize that this should not be viewed as a “no-till versus tillage” analysis. The majority of the 76 farms (63) were from the NC and NW regions with the other 13 farms from the SC, SW, and SE regions (none

from NE). All of the farms from the SW region (5) were in the low-profit group and 46% of the NC farms were in the high-profit group suggesting a possible region effect on profitability differences, but it is important to note that this is not a strong result given the sample size.

In summary, high-profit farms had significantly higher gross income than low-profit farms and slightly lower costs leading to a 3-year average difference in returns of \$134.30 per acre. Because of the years analyzed, average yields were quite low and crop insurance payments reflected a large portion of income. The primary driver of the difference in returns is income, as opposed to costs, and more specifically yield differences and not price differences. The average return to management for all farms across this 3-year period was \$54.47 per acre, but the top third of farms earned a positive \$123.41 per acre compared to a negative \$10.89 per acre for the low-profit farms. Figure 3a contains a breakdown of prices and yields for the three profitability groups and Figure 3b presents a similar breakdown of each group's costs.

Non-irrigated Wheat (Table 4)

On average, high-profit farms earned \$116.24 per acre more profit than the low-profit farms and \$49.08 per acre more than the mid-profit farms. Prices averaged \$7.10 per bushel across all farms and were slightly lower for the mid- and low-profit farms (\$7.06) compared to the high-profit farms (\$7.18). Yields were comparable for the high- and mid-profit farms (41.2 and 39.5 bu/ac), which were higher than for the low-profit farms (31.1 bu/ac). On average, all three groups collected crop insurance indemnity payments, but they were considerably lower than other non-irrigated crops. Gross income was \$74.45 per acre higher for the high-profit farms compared to the low-profit farms. However, mid-profit farms gross income was only \$18.62 per acre lower than the high-profit farms. Total costs were inversely related to yield with the high-profit farms having the lowest cost (\$247.60) and low-profit farms having the highest cost (\$289.39). The difference between the high- and low-profit farms was \$41.79 per acre and the difference between the high- and mid-profit farms was \$30.46 per acre. At \$24.55 per acre, machinery cost was the biggest difference between high- and low-profit farms. High-profit farms had lower costs in most categories with the exception of fertilizer and land where their costs were slightly higher than the low-profit farms. The mid-profit farms had higher fertilizer and land costs than the other two groups.

The difference in profits between the high- and low-profit farms was 64.1% due to gross income differences and 35.9% due to cost differences. Of the crop income difference (i.e., excluding government payments and crop insurance) 84% was due to yield differences, 11% due to operator percentage differences, and only 5% due to price differences. Machinery costs accounted for over half of the cost differences. The low-profit farms have the lowest operator percentage and they have the lowest land costs, but they are only \$1.21 per acre lower than high-profit farms. High-profit farms had the second highest acreage with 786 acres, mid-profit farms had the highest acreage with 802 acres, and low-profit farms had the lowest with 622 acres. Of the 139 farms, 42 were classified as no-till operations. These 42 no-till operations were spread over the high-, mid-, and low-profit categories as 13, 16, and 13, respectively, indicating no-till was not a major determinant of profit ranking. However, because this is comparing farms across the entire state it is important to recognize that this should not be viewed as a “no-till versus tillage” analysis. The majority of the 139 farms (116) were from the NC, NW, and SE regions with the other 23 farms from the SC, SW, and NE regions. While region did not appear to have a major impact on profitability (i.e., farms for the various regions were distributed fairly evenly across all three profit

categories), there were two exceptions – (1) farms from SE tended to be in the high-profit category slightly more often than in the mid- and low-profit categories and (2) farms in SW tended to be in the low-profit category more often than not. This hints at a possible region effect on profitability differences over this 3-year period, but it is important to note this is not a strong result given the sample size.

In summary, high-profit farms had significantly higher gross income than low-profit farms (+29%) and lower costs (-14%) leading to a 3-year average difference in returns of \$116.24 per acre. Almost 2/3 of the profit difference is due to income differences, with most of that being related to yield and not price, with the other 1/3 being related to lower costs. The average return to management for all farms across this 3-year period was \$26.79 per acre, but the top third of farms earned a positive \$81.85 per acre compared to a negative \$34.39 per acre for the low-profit farms. Figure 4a contains a breakdown of prices and yields for the three profitability groups and Figure 4b presents a similar breakdown of each group's costs.

Non-irrigated Full-season Soybeans (Table 5)

High-profit farms earned an average of \$158.51 per acre more profit than the low-profit farms and \$68.43 per acre more than the mid-profit farms. Prices averaged \$12.56 per bushel across all farms and were similar for the three profit groups (range of \$12.51 to \$12.61). Yields were relatively low for all three groups, but followed the same pattern as profit groupings, i.e., high-profit farms had the highest yield and low-profit farms had the lowest yield. Crop insurance indemnity payments averaged \$33.64 per acre across all groups and ranged from a low of \$24.60 for the high-profit farms to a high of \$41.90 for the low-profit farms. The higher crop insurance payment for the low-profit farms was not sufficient to offset lower crop income as gross income was \$140.95 per acre higher for the high-profit farms compared to the low-profit farms. Mid-profit farms had \$116.05 per acre lower gross income than high-profit farms. Total costs were lowest for the mid-profit farms (\$274.74) and highest for the low-profit farms (\$339.91). The difference between the high- and low-profit farms was only \$17.55 per acre. The two biggest cost differences between the high- and low-profit farms were machinery and land. High-profit farms had \$18.50 per acre lower machinery costs, but \$20.92 per acre higher land costs. Other than land and seed, the high-profit farms had lower costs than the low-profit farms in all other categories.

Because the high- and low-profit farms had similar costs, most of the profit difference between these two groups was due to income differences (88.9% of difference due to income and 11.1% due to costs). Crop income (excluding government payments and crop insurance) can vary due to yield, price, and operator percentage. Comparing the high- versus low-profit farms most of the difference is due to yield, a small amount due to operator percentage differences and essentially none is due to price. Higher operator percentages are an indication of either owned or cash rented land and thus we would expect higher land costs in this situation. High- and low-profit farms have similar operator percentages (88.6% and 87.1%) but the high-profit farm has considerably higher land costs suggesting higher cash rents. The mid-profit farms have the lowest operator percentage and the lowest land costs. High-profit farms had the highest acreage with 419 acres, mid-profit farms were second with 400 acres, and low-profit farms were third with 370 acres. Thus, high-profit farms had 5% more acres than mid-profit farms and 13% more acres than low-profit farms. Of the 102 farms, 38 were classified as no-till operations. These 38 no-till operations were spread over the high-, mid-, and low-profit categories as 16, 11, and 11, respectively, suggesting no-till farms tend to be in the high-profit category slightly more often than

in the mid- or low-profit categories. However, because this is comparing farms across the entire state it is important to recognize that this should not be viewed as a “no-till versus tillage” analysis. The majority (79) of the 102 farms were from the NC and SE with the other 23 farms from SC, NE, and NW regions (none from SW). Region did not appear to have a significant impact on profitability (i.e., farms for the various regions were distributed fairly evenly across all three profit categories). There was possibly a slight tendency for NW farms to be less profitable and NE farms being more profitable than average, but it is important to note that this is not a strong result given the small number of farms in these regions.

In summary, high-profit farms had significantly higher gross income than low-profit farms and slightly lower costs leading to a 3-year average difference in returns of \$158.51 per acre. The primary driver of the difference in returns is income, as opposed to costs, and more specifically yield differences and not price differences. The average return to management for all farms across this 3-year period was \$48.06 per acre, but the top third of farms earned a positive \$123.70 per acre compared to a negative \$34.80 per acre for the low-profit farms. Figure 5a contains a breakdown of prices and yields for the three profitability groups and Figure 5b presents a similar breakdown of each group’s costs.

Non-irrigated Double-crop Soybeans (Table 6)

On average, high-profit farms earned \$112.96 per acre more profit than the low-profit farms and \$59.28 per acre more than the mid-profit farms. Prices averaged \$12.69 per bushel across all farms and were similar for the low- and mid-profit farms (\$12.62 and \$12.63), but were slightly higher for the high-profit farms (\$12.83). Yields were similar for mid- and low-profit farms and slightly higher for high-profit farms. In spite of high-profit farms having the highest yield, they also had the highest crop insurance payment (average of \$57.75 per acre). Mid- and low-profit farms had essentially the same yields, but mid-profit farms had about \$10 per acre higher crop insurance payments. Given the higher yield, price, and crop insurance indemnity, high-profit farms averaged \$91.41 per acre more gross income than the low-profit farms. They also averaged \$74.35 per acre more than the mid-profit farms. Total costs were lowest for the mid-profit farms (\$171.29) and highest for the low-profit farms (\$207.92). The difference between the high- and low-profit farms was \$21.55 per acre. The two biggest cost differences between the high- and low-profit farms were machinery and land. High-profit farms had \$17.03 per acre lower machinery costs, but \$9.75 per acre higher land costs. Other than land and crop insurance, the high-profit farms had lower costs than the low-profit farms in all other categories.

Most of the profit difference between the high- and low-profit farms was due to income differences (80.9% of difference due to income and 19.1% due to costs). Crop income (excluding government payments and crop insurance) can vary due to yield, price, and operator percentage. Comparing the high- versus low-profit farms most of the difference is due to yield, a small amount due to price differences and a very small amount due to operator percentage differences. High-profit farms had the highest acreage with 590 acres, mid-profit farms were second with 417 acres, and low-profit farms were third with 221 acres. Thus, high-profit farms had 41% more acres than mid-profit farms and 167% more acres than low-profit farms. Of the 31 farms, 12 were classified as no-till operations. These 12 no-till operations were spread over the high-, mid-, and low-profit categories as 5, 3, and 4, respectively, indicating no-till was not a major determinant of profit ranking. However, because this is comparing farms across the entire state it is important to recognize that this should not be viewed as a “no-till versus tillage” analysis. The majority (30) of

the 31 farms were from the NC and SE regions (none from SW, NE, or NW). Farms from the NC region tended to be in the mid- and low-profit groups most often and farms from the SE region tended to be in the high- and mid-profit groups most often suggesting a slight regional effect as to the profitability of double crop soybeans over this 3-year period.

In summary, high-profit farms had significantly higher gross income than low-profit farms (+61%) and slightly lower costs (-10%) leading to a 3-year average difference in returns of \$112.96 per acre. The primary driver of the difference in returns is income, as opposed to costs, and more specifically yield and crop insurance differences and not price differences. The average return to management for all farms across this 3-year period was -\$2.99 per acre, indicating that planting double crop soybeans actually made the producer worse off. However, for producers in the high-profit group they earned an extra \$54.48 per acre (the only group of the three that had positive returns). Figure 6a contains a breakdown of prices and yields for the three profitability groups and Figure 6b presents a similar breakdown of each group's costs.

Non-irrigated Alfalfa (Table 7)

High-profit farms earned an average of \$280.16 per acre more profit than the low-profit farms and \$154.66 per acre more than the mid-profit farms. Prices averaged \$177.93 per ton across all farms and were highest for high-profit farms (\$183.99) and lowest for mid-profit farms (\$169.81). Yields followed the same pattern as profit groupings, i.e., high-profit farms had the highest yield (3.2 ton/ac) and low-profit farms had the lowest yield (1.7 ton/ac). Given the higher yield and price, high-profit farms averaged \$267.61 per acre more gross income than the low-profit farms. They also averaged \$138.38 per acre more than the mid-profit farms. Total costs were lowest for the high-profit farms (\$353.16) and highest for the mid-profit farms (\$369.45). The difference between the high- and low-profit farms was only \$12.55 per acre. The biggest cost differences between the high- and low-profit farms were machinery, land, and chemicals. High-profit farms had \$17.02 per acre lower machinery costs even though they had 82% higher yields, \$13.08 per acre higher land costs, and \$11.15 per acre lower chemical costs.

The difference in profits between the high- and low-profit farms was 95.5% due to gross income differences and only 4.5% due to cost differences. Of the crop income difference (i.e., excluding government payments and crop insurance) 84% was due to yield differences, 13% due to operator percentage differences, and only 3% due to price differences. Operator percentage for high-profit farms was 96.0% (highest of all crop enterprises analyzed) indicating these farms tend to produce alfalfa on owned or cash rented land. The mid- and low-profit farms had lower operator percentages, and lower land costs, indicating a higher portion of rented land is on a crop share basis. High-profit farms had the highest acreage with 161 acres, mid-profit farms having the lowest acreage with 80 acres, and low-profit farms having 86 acres. Of the 34 farms analyzed, the majority (27) were from the NC and NW regions with the remaining 7 farms from SC, NE, and SE regions (no farms were from SW). Region did not appear to have a significant impact on profitability (i.e., farms for the various regions were distributed fairly evenly across all three profit categories).

In summary, high-profit farms had significantly higher gross income than low-profit farms (+89%) and slightly lower costs (-3%) leading to a 3-year average difference in returns of \$280.16 per acre. Almost all of the profit difference is due to income differences, with most of that being related to yield and not price. The average return to management for all farms across this 3-year period was \$68.44 per acre, but the top third of farms earned a positive \$213.67 per acre

compared to a negative \$66.49 per acre for the low-profit farms. Figure 7a contains a breakdown of prices and yields for the three profitability groups and Figure 7b presents a similar breakdown of each group's costs.

Summary

Several conclusions can be drawn from this information. The difference between the average profit (returns to management) for high-profit and low-profit farms ranged from \$112.96 for double crop soybeans to \$334.73 for irrigated corn (see Table 8). This indicates there are extremely large differences in profitability across producers at a point in time (here, the years 2011-2013). Furthermore, for all enterprises examined (with the exception of irrigated corn), the bottom third of producers had negative average returns compared to the mid- and high-profit farms that had positive returns (in the case of non-irrigated corn and double crop soybeans the mid-profit farms also had negative returns on average). That is, even during relatively good economic times (for the most part 2011 to 2013 were good years for crop producers in Kansas), the bottom one-third of producers, in general, are not profitable.³ This wide disparity in profitability makes it difficult to design policy that supports agriculture because the needed support varies considerably. That is, if a goal of farm policy is to provide income support to producers, the level of support required to ensure producers obtain some "reasonable rate of return" will vary considerably across producers. Put another way, the heterogeneous nature of producers makes designing farm policy a very difficult task.

For all enterprises except non-irrigated wheat, the high-profit farms had the largest acres devoted to that enterprise providing some evidence that larger operations are more profitable. For all enterprises examined, high-profit farms had the highest revenue, almost always due to highest yield, but high-profit farms never had the highest cost. This indicates that producers can manage cost to achieve good yields without having excessively high costs. Figure 8a shows the decomposition of crop income advantage for high-profit farms versus low-profit farms – price effect, yield effect, and operator percentage effect (the sum of these three components equals the total crop income advantage). For all of the enterprises examined, the average yield difference plays a much larger role in explaining income differences than the average price difference. That is, for those enterprises where income differences are important in explaining profit differences, it is the higher yields that are primarily responsible for the income difference.

For most of the enterprises considered, machinery costs represented a major cost difference between high- and low-profit farms. The difference in machinery costs between these two groups ranged from +\$2.83 per acre for irrigated corn (high-profit farms having higher costs) to -\$24.80 for non-irrigated sorghum, with all enterprises (except irrigated corn) in the -\$17 to -\$25 range. While \$17-25 per acre may not seem like a terribly high number for irrigated enterprises or for crops in the Corn Belt, it is quite significant for non-irrigated crop production in Kansas where the average non-irrigated cash rental rate as reported by Kansas Agricultural Statistics for 2013 was \$53.00. Thus, machinery management is one of the areas producers should focus their efforts to improve their relative profit positions.

³ It should be noted that while these years were good years on average in agriculture, there were regions of Kansas that had weather conditions (e.g., drought) that prevented them from benefiting from the good crop prices.

**Table 1. Kansas Farm Management Association Enterprise Analysis
Nonirrigated Corn -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	29	30	29		
Enterprise acres	596	367	554	43	8%
Yield per acre, bu	67.4	58.2	43.8	23.6	54%
Operator percentage	89.0%	88.8%	82.3%	6.7%	8%
Price per bushel	\$5.89	\$5.87	\$5.76	\$0.12	2%
INCOME (\$/acre)					
Crop income	\$364.66	\$311.28	\$228.23	\$136.43	60%
Crop insurance indemnity	\$112.46	\$111.51	\$104.95	\$7.52	7%
Government payment	\$14.15	\$13.97	\$14.63	-\$0.48	-3%
Gross income	\$495.46	\$442.97	\$351.04	\$144.43	41%
COSTS (\$/acre)¹					
Seed	\$59.09	\$57.82	\$57.60	\$1.49	3%
Fertilizer	\$85.95	\$91.43	\$88.64	-\$2.69	-3%
Herbicide-insecticide	\$33.05	\$33.64	\$38.29	-\$5.24	-14%
Crop insurance	\$16.83	\$18.61	\$16.14	\$0.69	4%
Repairs	\$21.21	\$22.69	\$29.39	-\$8.18	-28%
Machine hire	\$12.00	\$11.42	\$16.34	-\$4.34	-27%
Fuel	\$18.01	\$17.80	\$18.22	-\$0.21	-1%
Depreciation	\$29.58	\$34.69	\$33.77	-\$4.18	-12%
Labor	\$34.20	\$39.32	\$35.64	-\$1.44	-4%
Total machinery	\$115.00	\$125.93	\$133.34	-\$18.35	-14%
Other	\$29.46	\$34.75	\$30.94	-\$1.48	-5%
Land	\$58.68	\$57.62	\$35.47	\$23.21	65%
Interest	\$24.33	\$25.22	\$27.16	-\$2.83	-10%
Total Cost	\$422.38	\$445.03	\$427.58	-\$5.20	-1%
Net Return to Management	\$73.08	-\$2.05	-\$76.54	\$149.62	

¹ Does not include any production expenses paid by the the landowner.

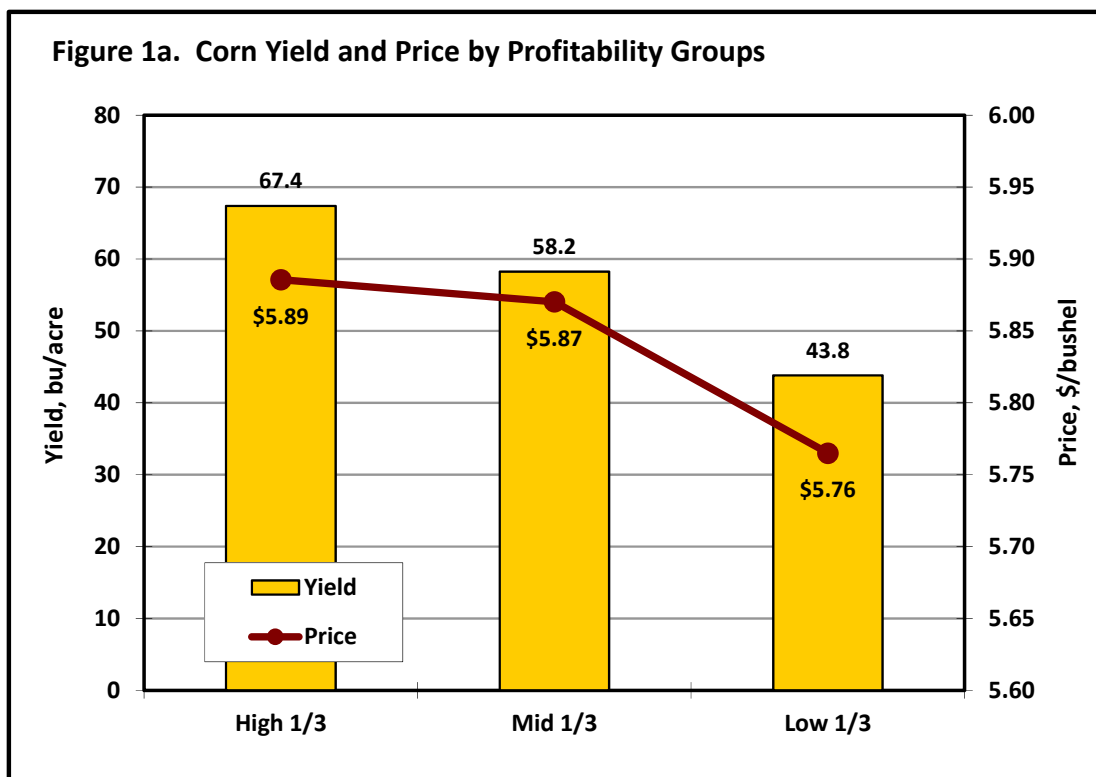


Figure 1a. Relationship between price and yields for low-, medium- and high-profit farms, Non-irrigated corn enterprise.

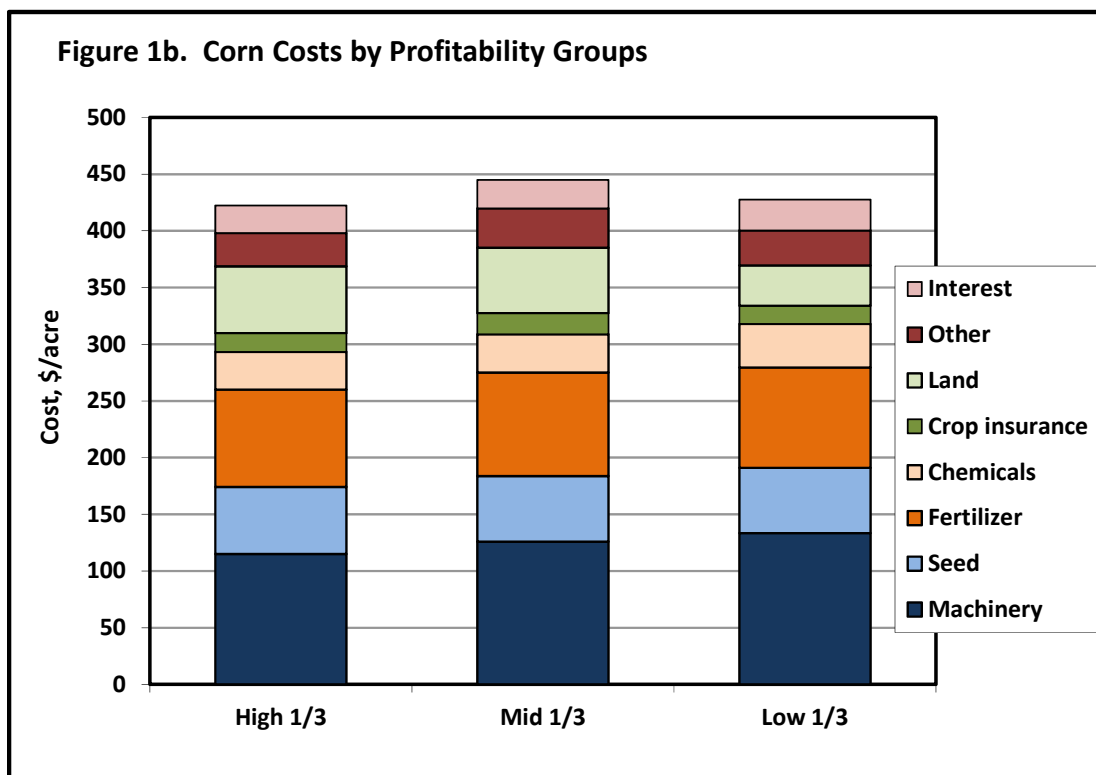


Figure 1b. Relationship of different costs between low-, medium-, and high-profit farms, Non-irrigated corn enterprise.

**Table 2. Kansas Farm Management Association Enterprise Analysis
Irrigated Corn -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	11	11	11		
Enterprise acres	826	378	379	447	118%
Yield per acre, bu	180.1	145.1	113.1	67.0	59%
Operator percentage	90.6%	88.5%	73.7%	16.9%	23%
Price per bushel	\$6.04	\$6.00	\$5.66	\$0.38	7%
<u>INCOME (\$/acre)</u>					
Crop income	\$1,076.08	\$854.80	\$633.86	\$442.22	70%
Crop insurance indemnity	\$7.81	\$53.45	\$39.16	-\$31.35	-80%
Government payment	\$29.46	\$21.00	\$15.53	\$13.93	90%
Gross income	\$1,135.64	\$960.08	\$693.49	\$442.14	64%
<u>COSTS (\$/acre)¹</u>					
Seed	\$100.24	\$80.16	\$84.65	\$15.59	18%
Fertilizer	\$138.51	\$124.26	\$125.62	\$12.89	10%
Herbicide-insecticide	\$59.72	\$57.62	\$52.69	\$7.03	13%
Crop insurance	\$26.68	\$38.19	\$27.90	-\$1.22	-4%
Repairs	\$25.91	\$26.66	\$33.93	-\$8.01	-24%
Machine hire	\$27.08	\$37.19	\$14.01	\$13.06	93%
Fuel	\$29.34	\$23.96	\$31.32	-\$1.99	-6%
Depreciation	\$50.29	\$59.28	\$49.43	\$0.86	2%
Labor	\$44.65	\$44.78	\$45.74	-\$1.09	-2%
Total machinery	\$177.27	\$191.87	\$174.43	\$2.83	2%
Other	\$136.17	\$126.97	\$102.82	\$33.35	32%
Land	\$100.35	\$130.04	\$66.70	\$33.65	50%
Interest	\$43.58	\$49.55	\$40.30	\$3.28	8%
Total Cost	\$782.53	\$798.66	\$675.12	\$107.42	16%
Net Return to Management	\$353.10	\$161.42	\$18.38	\$334.73	

¹ Does not include any production expenses paid by the the landowner.

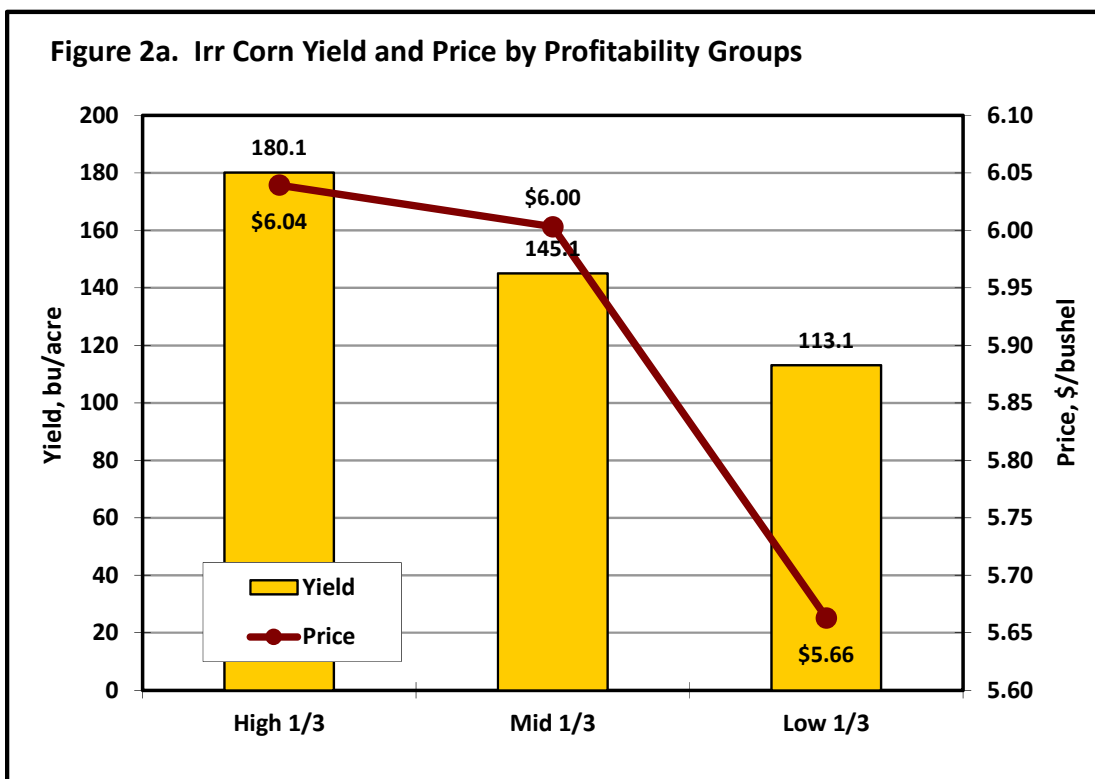


Figure 2a. Relationship between price and yields for low-, medium-, and high-profit farms, irrigated corn enterprise.

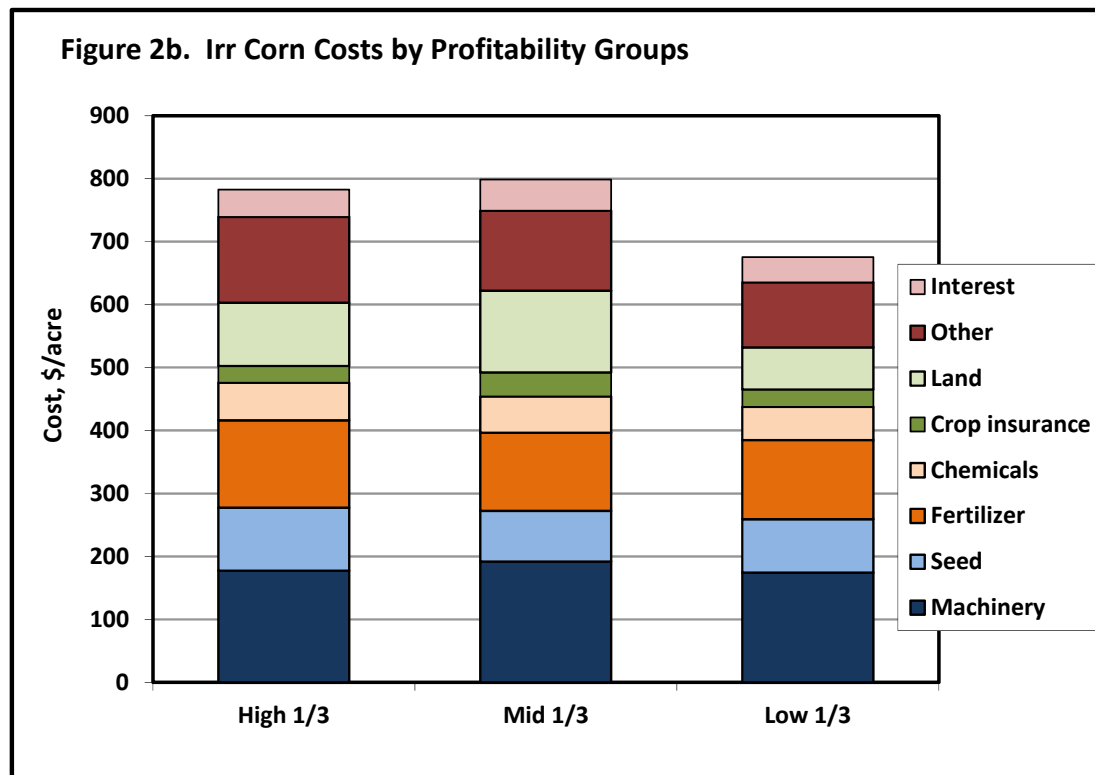


Figure 2b. Relationship of different costs between low-, medium-, and high-profit farms, irrigated corn enterprise.

**Table 3. Kansas Farm Management Association Enterprise Analysis
Nonirrigated Sorghum -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	25	26	25		
Enterprise acres	463	440	270	193	71%
Yield per acre, bu	67.8	51.4	49.4	18.5	37%
Operator percentage	84.8%	82.7%	81.5%	3.3%	4%
Price per bushel	\$5.57	\$5.62	\$5.55	\$0.02	0%
INCOME (\$/acre)					
Crop income	\$364.55	\$275.86	\$252.34	\$112.21	44%
Crop insurance indemnity	\$49.40	\$62.92	\$41.88	\$7.51	18%
Government payment	\$15.51	\$14.32	\$13.67	\$1.84	13%
Gross income	\$436.48	\$356.68	\$313.08	\$123.40	39%
COSTS (\$/acre)¹					
Seed	\$12.45	\$16.44	\$16.85	-\$4.40	-26%
Fertilizer	\$73.79	\$58.86	\$64.82	\$8.96	14%
Herbicide-insecticide	\$44.27	\$42.42	\$43.10	\$1.18	3%
Crop insurance	\$15.69	\$15.08	\$16.37	-\$0.68	-4%
Repairs	\$15.08	\$18.52	\$22.17	-\$7.09	-32%
Machine hire	\$9.41	\$6.18	\$9.69	-\$0.28	-3%
Fuel	\$11.82	\$18.62	\$16.47	-\$4.65	-28%
Depreciation	\$21.75	\$24.50	\$23.96	-\$2.21	-9%
Labor	\$20.95	\$27.93	\$31.53	-\$10.58	-34%
Total machinery	\$79.02	\$95.76	\$103.82	-\$24.80	-24%
Other	\$19.82	\$23.43	\$25.25	-\$5.43	-21%
Land	\$50.34	\$35.23	\$35.20	\$15.14	43%
Interest	\$17.70	\$18.43	\$18.56	-\$0.86	-5%
Total Cost	\$313.08	\$305.66	\$323.97	-\$10.89	-3%
Net Return to Management	\$123.41	\$51.03	-\$10.89	\$134.30	

¹ Does not include any production expenses paid by the the landowner.

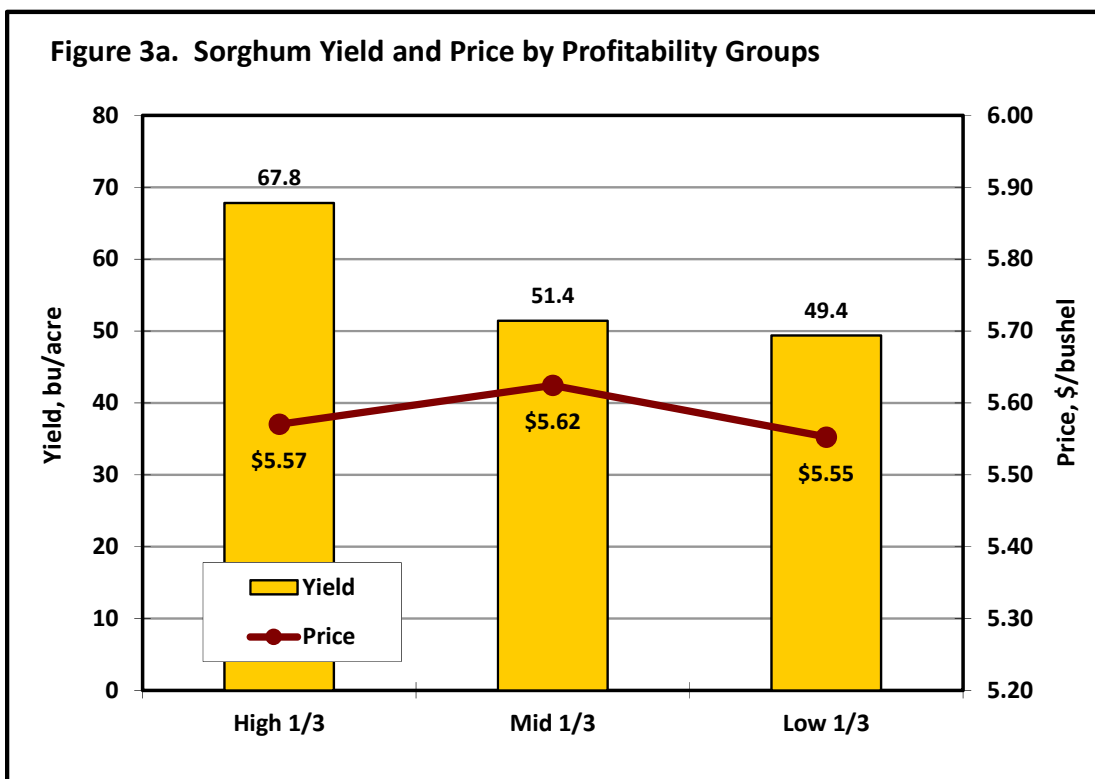


Figure 3a. Relationship between price and yields for low-, medium-, and high-profit farms, Sorghum enterprise.

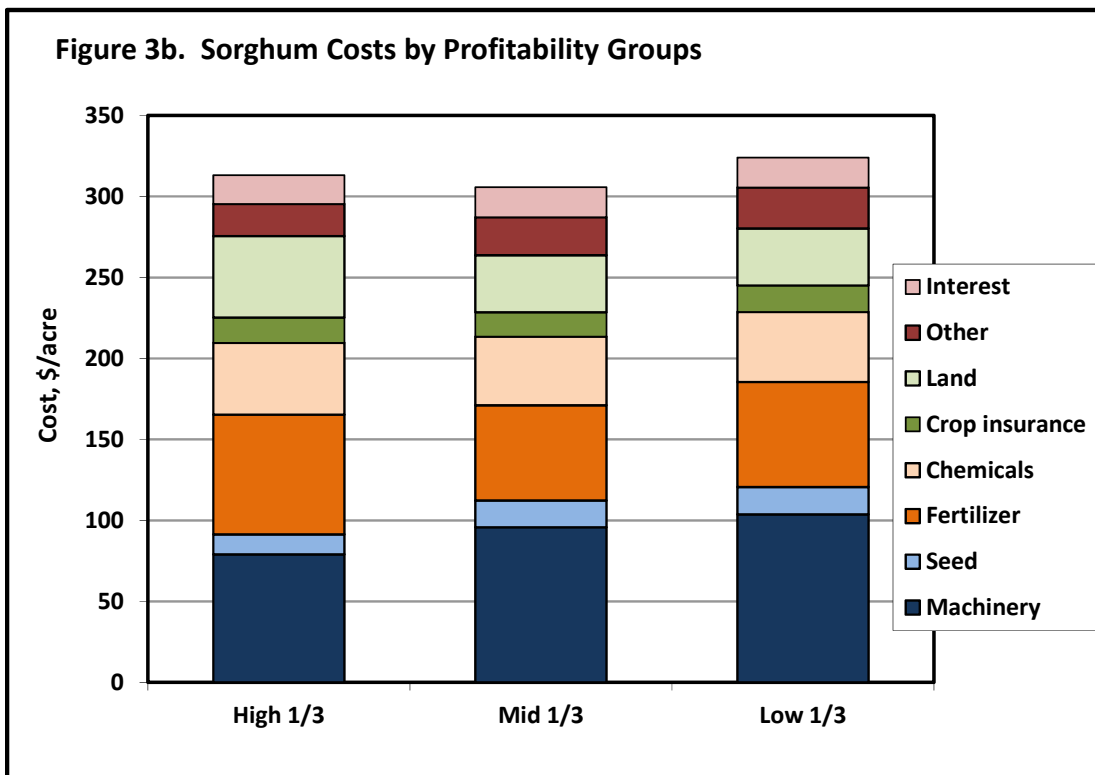


Figure 3b. Relationship of different costs between low-, medium-, and high-profit farms, Sorghum enterprise.

**Table 4. Kansas Farm Management Association Enterprise Analysis
Nonirrigated Wheat -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	46	47	46		
Enterprise acres	786	802	622	163	26%
Yield per acre, bu	41.2	39.5	31.1	10.1	32%
Operator percentage	84.6%	85.3%	81.6%	3.0%	4%
Price per bushel	\$7.18	\$7.06	\$7.06	\$0.12	2%
<u>INCOME (\$/acre)</u>					
Crop income	\$296.92	\$276.94	\$217.22	\$79.70	37%
Crop insurance indemnity	\$14.69	\$14.53	\$19.33	-\$4.63	-24%
Government payment	\$13.55	\$13.47	\$14.18	-\$0.63	-4%
Gross income	\$329.45	\$310.84	\$255.00	\$74.45	29%
<u>COSTS (\$/acre)¹</u>					
Seed	\$14.45	\$14.60	\$16.03	-\$1.58	-10%
Fertilizer	\$54.97	\$63.73	\$51.45	\$3.51	7%
Herbicide-insecticide	\$13.60	\$16.35	\$19.94	-\$6.34	-32%
Crop insurance	\$12.93	\$14.75	\$15.20	-\$2.28	-15%
Repairs	\$16.11	\$17.85	\$23.75	-\$7.64	-32%
Machine hire	\$7.86	\$7.57	\$9.35	-\$1.49	-16%
Fuel	\$14.24	\$14.63	\$16.32	-\$2.08	-13%
Depreciation	\$22.67	\$24.36	\$26.77	-\$4.10	-15%
Labor	\$22.34	\$25.18	\$31.58	-\$9.24	-29%
Total machinery	\$83.21	\$89.59	\$107.76	-\$24.55	-23%
Other	\$19.01	\$20.55	\$27.78	-\$8.77	-32%
Land	\$34.15	\$41.20	\$32.94	\$1.21	4%
Interest	\$15.28	\$17.29	\$18.28	-\$3.00	-16%
Total Cost	\$247.60	\$278.06	\$289.39	-\$41.79	-14%
Net Return to Management	\$81.85	\$32.78	-\$34.39	\$116.24	

¹ Does not include any production expenses paid by the the landowner.

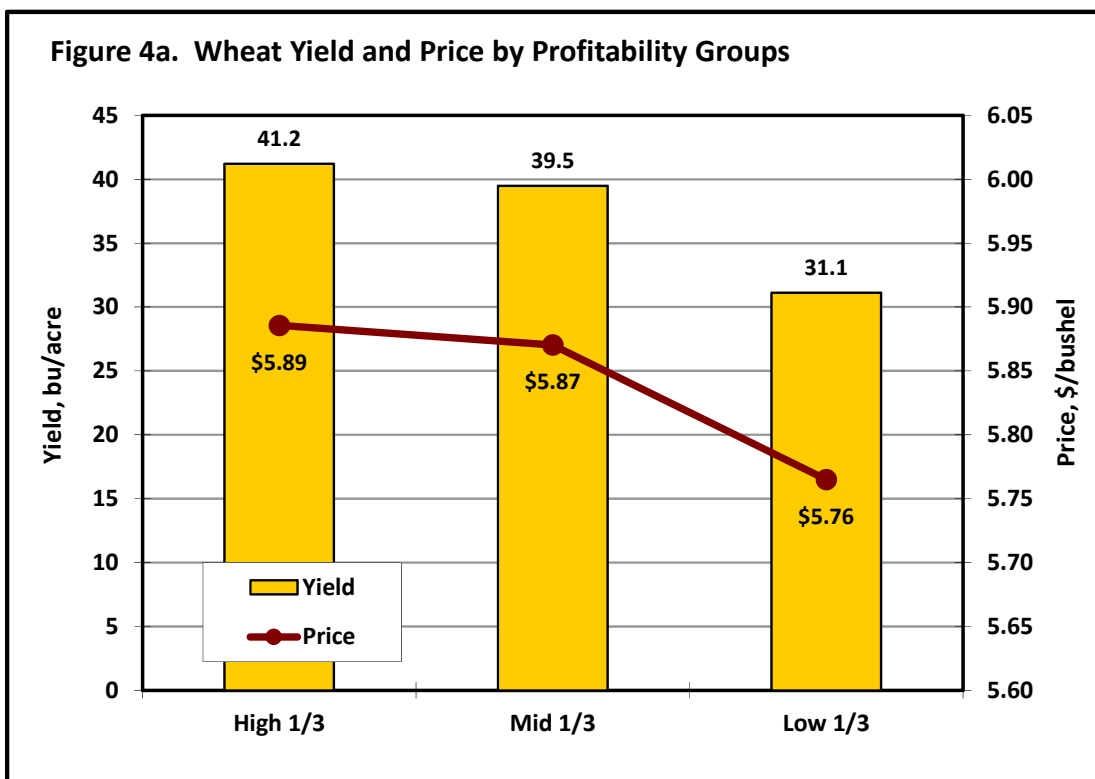


Figure 4a. Relationship between price and yields for low-, medium-, and high-profit farms, Wheat enterprise.

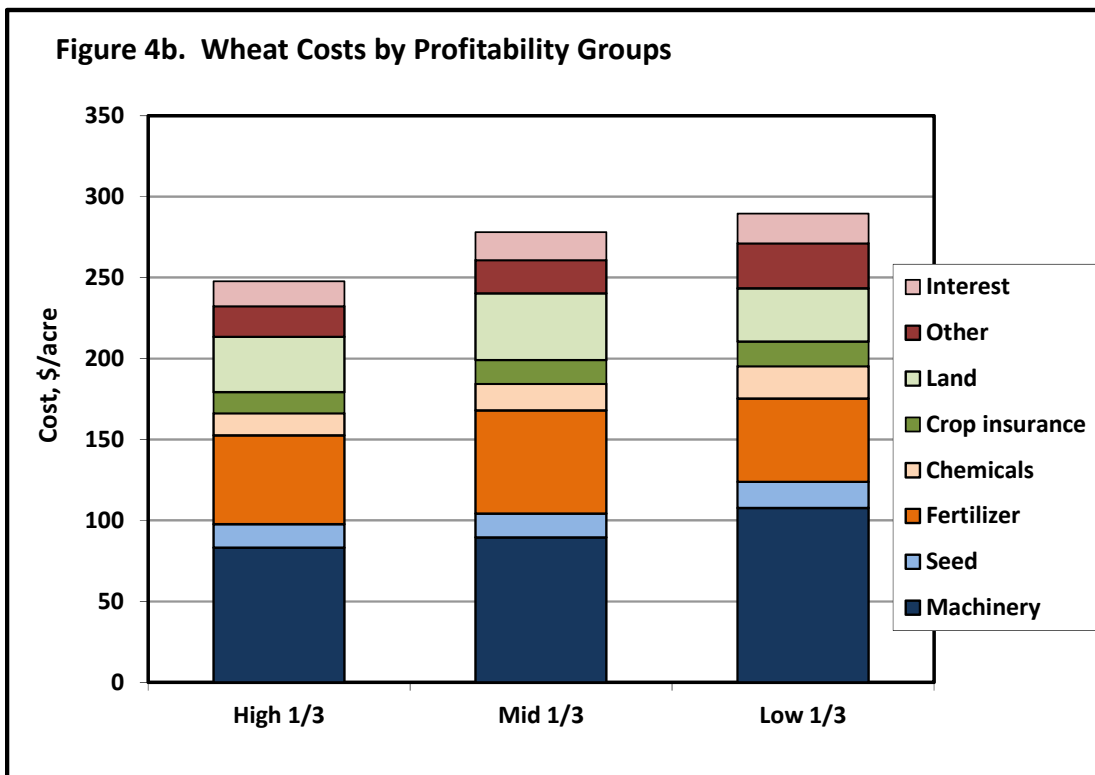


Figure 4b. Relationship of different costs between low-, medium-, and high-profit farms, Wheat enterprise.

**Table 5. Kansas Farm Management Association Enterprise Analysis
Nonirrigated Full-Season Soybeans -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	34	34	34		
Enterprise acres	419	400	370	49	13%
Yield per acre, bu	32.2	22.6	19.6	12.6	65%
Operator percentage	88.6%	82.4%	87.1%	1.5%	2%
Price per bushel	\$12.61	\$12.51	\$12.58	\$0.03	0%
<u>INCOME (\$/acre)</u>					
Crop income	\$401.83	\$280.26	\$245.79	\$156.04	63%
Crop insurance indemnity	\$24.60	\$34.42	\$41.90	-\$17.30	-41%
Government payment	\$14.85	\$11.26	\$12.82	\$2.03	16%
Gross income	\$446.06	\$330.01	\$305.10	\$140.95	46%
<u>COSTS (\$/acre)¹</u>					
Seed	\$52.40	\$49.73	\$51.18	\$1.22	2%
Fertilizer	\$11.15	\$9.63	\$17.04	-\$5.89	-35%
Herbicide-insecticide	\$27.71	\$27.76	\$32.25	-\$4.54	-14%
Crop insurance	\$10.52	\$13.00	\$13.50	-\$2.98	-22%
Repairs	\$22.44	\$19.40	\$29.94	-\$7.50	-25%
Machine hire	\$7.13	\$6.46	\$9.36	-\$2.24	-24%
Fuel	\$16.71	\$16.37	\$20.51	-\$3.81	-19%
Depreciation	\$30.88	\$28.42	\$31.96	-\$1.07	-3%
Labor	\$29.63	\$25.43	\$33.51	-\$3.88	-12%
Total machinery	\$106.78	\$96.08	\$125.28	-\$18.50	-15%
Other	\$27.84	\$22.88	\$33.15	-\$5.31	-16%
Land	\$67.00	\$37.50	\$46.08	\$20.92	45%
Interest	\$18.95	\$18.15	\$21.40	-\$2.46	-11%
Total Cost	\$322.35	\$274.74	\$339.91	-\$17.55	-5%
Net Return to Management	\$123.70	\$55.27	-\$34.80	\$158.51	

¹ Does not include any production expenses paid by the the landowner.

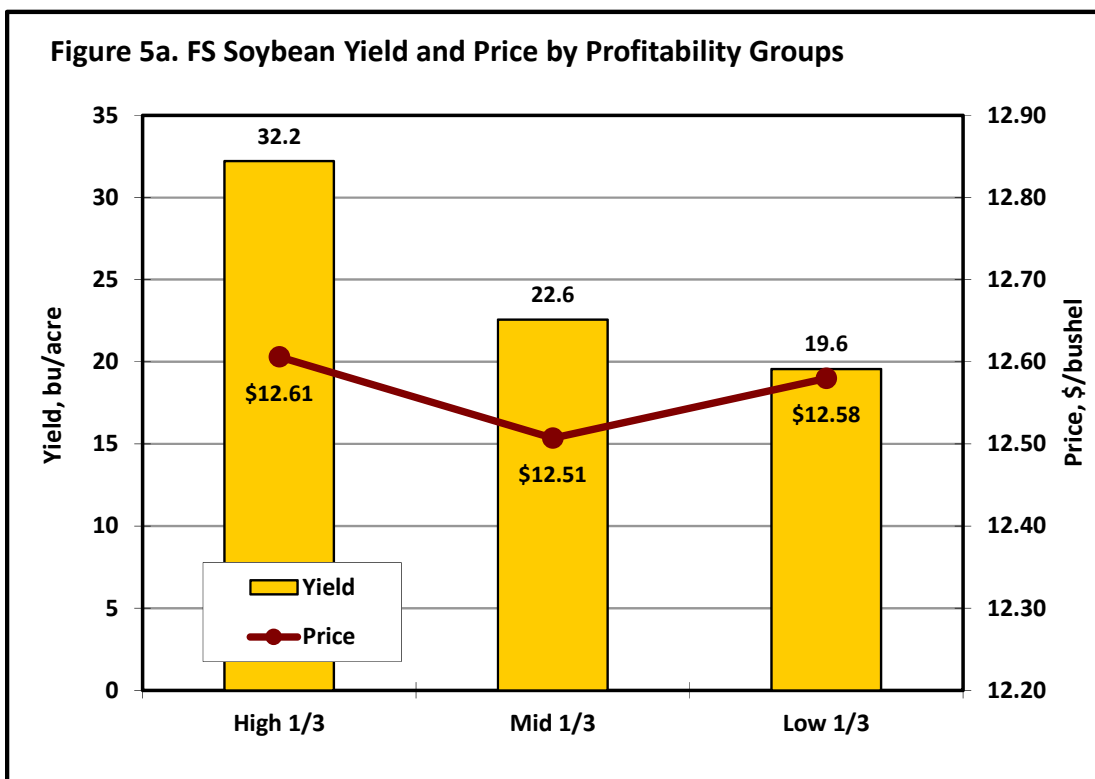


Figure 5a. Relationship between price and yields for low-, medium-, and high-profit farms, Full-season Soybean enterprise.

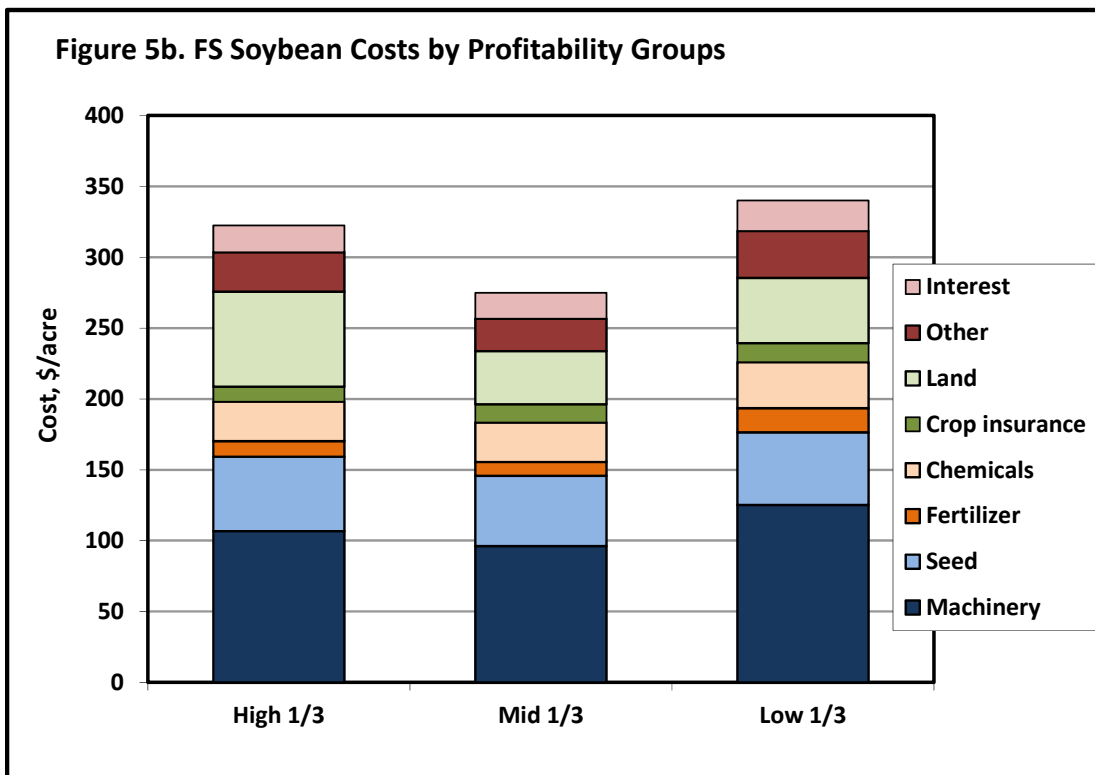


Figure 5b. Relationship of different costs between low-, medium-, and high-profit farms, Full-season Soybean enterprise.

**Table 6. Kansas Farm Management Association Enterprise Analysis
Double Crop Soybeans -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	10	11	10		
Enterprise acres	590	417	221	369	167%
Yield per acre, bushels	13.9	10.0	9.9	4.0	40%
Operator percentage	87.5%	85.8%	87.1%	0.5%	1%
Price per ton	\$12.83	\$12.63	\$12.62	\$0.21	2%
INCOME (\$/acre)					
Crop income	\$174.36	\$126.27	\$123.01	\$51.35	42%
Crop insurance indemnity	\$57.75	\$30.01	\$19.60	\$38.16	195%
Government payment	\$7.43	\$7.08	\$5.10	\$2.34	46%
Gross income	\$240.84	\$166.49	\$149.44	\$91.41	61%
COSTS (\$/acre)¹					
Seed	\$39.96	\$41.70	\$46.41	-\$6.45	-14%
Fertilizer	\$3.62	\$3.90	\$3.70	-\$0.07	-2%
Herbicide-insecticide	\$14.44	\$13.18	\$19.84	-\$5.41	-27%
Crop insurance	\$9.07	\$9.21	\$5.82	\$3.25	56%
Repairs	\$12.41	\$14.47	\$15.18	-\$2.76	-18%
Machine hire	\$3.07	\$5.49	\$11.51	-\$8.44	-73%
Fuel	\$11.28	\$11.66	\$12.64	-\$1.36	-11%
Depreciation	\$23.76	\$20.28	\$23.55	\$0.21	1%
Labor	\$15.57	\$14.39	\$20.26	-\$4.68	-23%
Total machinery	\$66.10	\$66.29	\$83.13	-\$17.03	-20%
Other	\$14.12	\$12.51	\$19.33	-\$5.21	-27%
Land	\$25.21	\$12.15	\$15.47	\$9.75	63%
Interest	\$13.84	\$12.34	\$14.22	-\$0.38	-3%
Total Cost	\$186.37	\$171.29	\$207.92	-\$21.55	-10%
Net Return to Management	\$54.48	-\$4.80	-\$58.48	\$112.96	

¹ Does not include any production expenses paid by the the landowner.

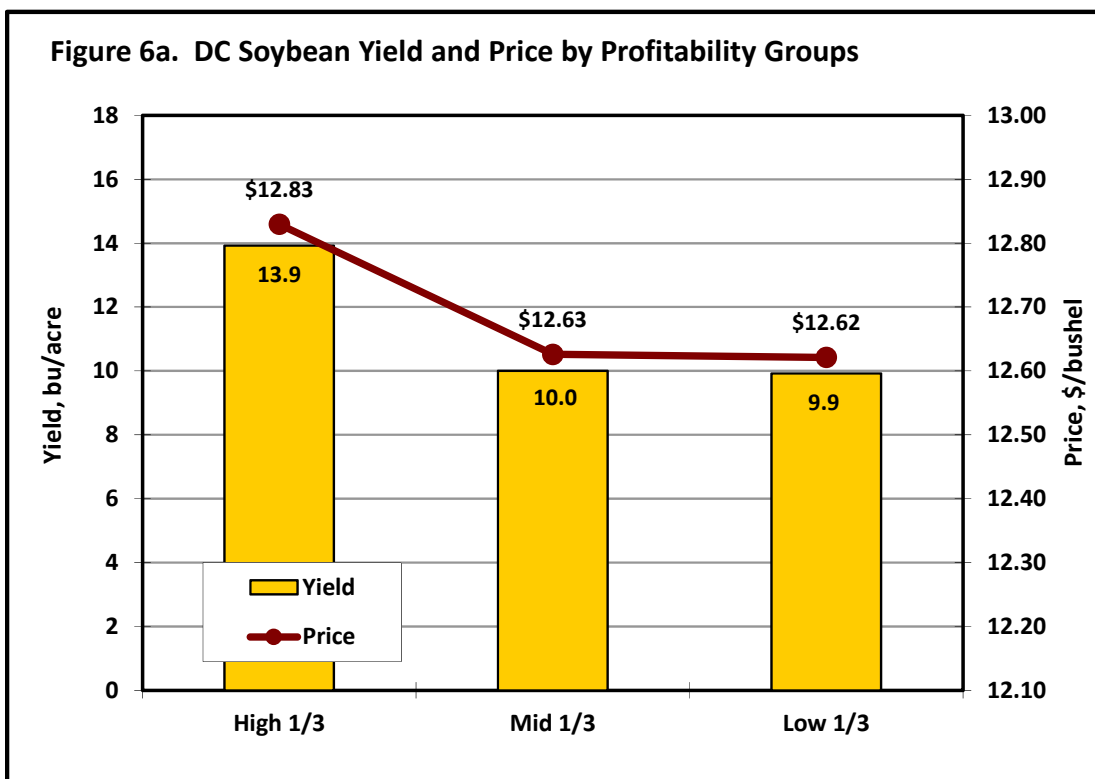


Figure 6a. Relationship between price and yields for low-, medium-, and high-profit farms, Double-crop Soybean enterprise.

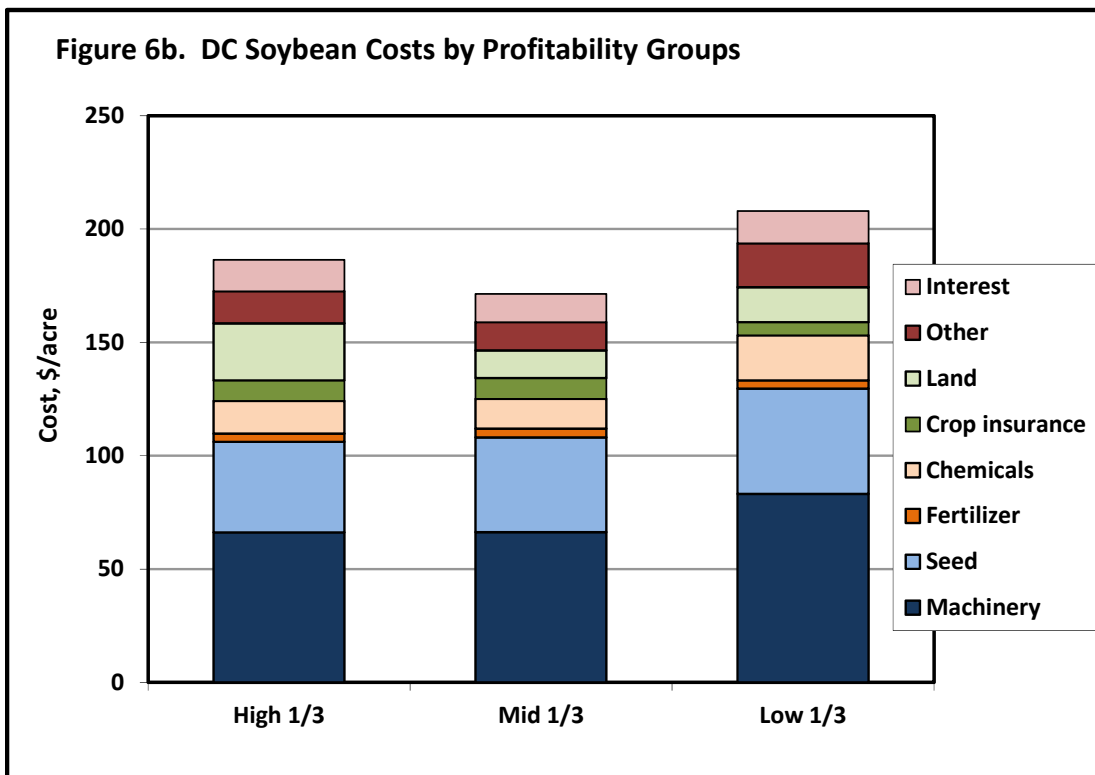


Figure 6b. Relationship of different costs between low-, medium-, and high-profit farms, Double-crop Soybean enterprise.

**Table 7. Kansas Farm Management Association Enterprise Analysis
Alfalfa -- State Averages, 2011-2013**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Absolute	%
Number of farms	11	12	11		
Enterprise acres	161	80	86	75	88%
Yield per acre, tons	3.2	2.5	1.7	1.4	82%
Operator percentage	96.0%	85.0%	87.6%	8.4%	10%
Price per ton	\$183.99	\$169.81	\$180.73	\$3.26	2%
INCOME (\$/acre)					
Crop income	\$551.34	\$393.81	\$280.80	\$270.54	96%
Crop insurance indemnity	\$0.69	\$0.02	\$1.01	-\$0.32	-32%
Government payment	\$10.98	\$31.43	\$11.01	-\$0.02	0%
Gross income	\$566.83	\$428.45	\$299.22	\$267.61	89%
COSTS (\$/acre)¹					
Seed	\$12.34	\$17.10	\$9.32	\$3.02	32%
Fertilizer	\$12.43	\$17.35	\$9.58	\$2.84	30%
Herbicide-insecticide	\$14.86	\$16.29	\$26.01	-\$11.15	-43%
Crop insurance	\$1.22	\$0.98	\$0.99	\$0.22	22%
Repairs	\$27.70	\$38.26	\$36.14	-\$8.45	-23%
Machine hire	\$8.65	\$0.31	\$15.69	-\$7.04	-45%
Fuel	\$22.05	\$26.61	\$21.11	\$0.94	4%
Depreciation	\$43.64	\$45.71	\$40.01	\$3.63	9%
Labor	\$69.42	\$78.18	\$75.52	-\$6.10	-8%
Total machinery	\$171.45	\$189.06	\$188.48	-\$17.02	-9%
Other	\$45.05	\$48.17	\$48.58	-\$3.52	-7%
Land	\$73.38	\$57.56	\$60.30	\$13.08	22%
Interest	\$22.43	\$22.93	\$22.45	-\$0.02	0%
Total Cost	\$353.16	\$369.45	\$365.71	-\$12.55	-3%
Net Return to Management	\$213.67	\$59.00	-\$66.49	\$280.16	

¹ Does not include any production expenses paid by the the landowner.

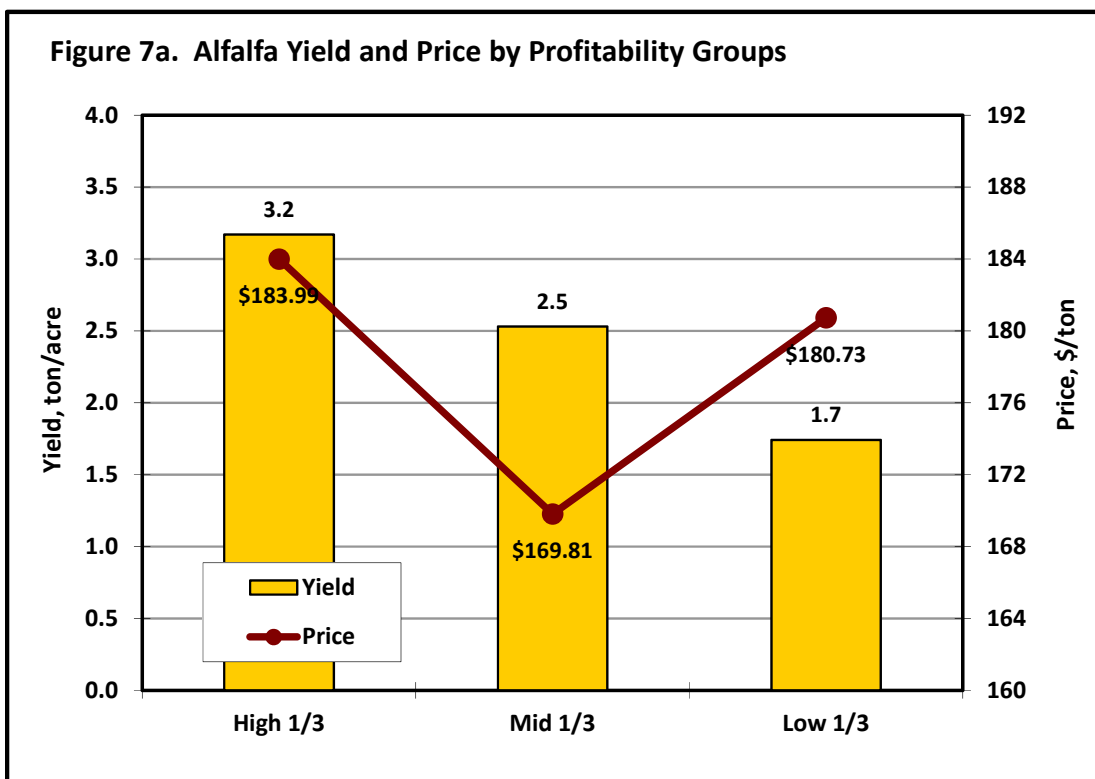


Figure 7a. Relationship between price and yields for low-, medium-, and high-profit farms, Alfalfa Soybean enterprise.

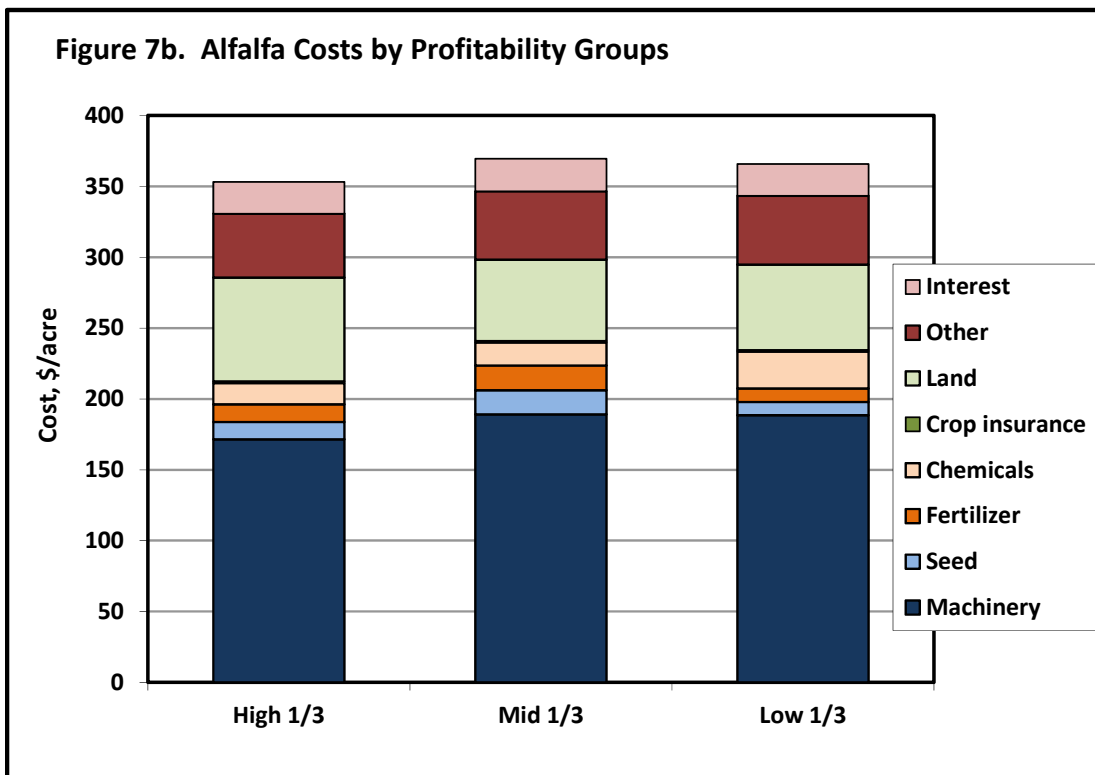


Figure 7b. Relationship of different costs between low-, medium-, and high-profit farms, Alfalfa enterprise.

**Table 8. Difference between the High 1/3 and Low 1/3 farms ranked on return to management
Kansas Farm Management Association Enterprise Analysis**

State Averages, 2011-2013

	Corn	Irr Corn	Sorghum	Wheat	FS SB	DC SB	Alfalfa
Number of farms	88	33	76	139	102	31	34
Enterprise acres	43	447	193	163	49	369	75
Yield per acre, bu	23.6	67.0	18.5	10.1	12.6	4.0	1.4
Operator percentage	6.7%	16.9%	3.3%	3.0%	1.5%	0.5%	8.4%
Price per unit	\$0.12	\$0.38	\$0.02	\$0.12	\$0.03	\$0.21	\$3.26
INCOME (\$/acre)							
Crop income	\$136.43	\$442.22	\$112.21	\$79.70	\$156.04	\$51.35	\$270.54
Crop ins. indemnity	\$7.52	-\$31.35	\$7.51	-\$4.63	-\$17.30	\$38.16	-\$0.32
Government payment	-\$0.48	\$13.93	\$1.84	-\$0.63	\$2.03	\$2.34	-\$0.02
Gross income	\$144.43	\$442.14	\$123.40	\$74.45	\$140.95	\$91.41	\$267.61
COSTS (\$/acre)¹							
Seed	\$1.49	\$15.59	-\$4.40	-\$1.58	\$1.22	-\$6.45	\$3.02
Fertilizer	-\$2.69	\$12.89	\$8.96	\$3.51	-\$5.89	-\$0.07	\$2.84
Herbicide-insecticide	-\$5.24	\$7.03	\$1.18	-\$6.34	-\$4.54	-\$5.41	-\$11.15
Crop insurance	\$0.69	-\$1.22	-\$0.68	-\$2.28	-\$2.98	\$3.25	\$0.22
Repairs	-\$8.18	-\$8.01	-\$7.09	-\$7.64	-\$7.50	-\$2.76	-\$8.45
Machine hire	-\$4.34	\$13.06	-\$0.28	-\$1.49	-\$2.24	-\$8.44	-\$7.04
Fuel	-\$0.21	-\$1.99	-\$4.65	-\$2.08	-\$3.81	-\$1.36	\$0.94
Depreciation	-\$4.18	\$0.86	-\$2.21	-\$4.10	-\$1.07	\$0.21	\$3.63
Labor	-\$1.44	-\$1.09	-\$10.58	-\$9.24	-\$3.88	-\$4.68	-\$6.10
Machinery	-\$18.35	\$2.83	-\$24.80	-\$24.55	-\$18.50	-\$17.03	-\$17.02
Other	-\$1.48	\$33.35	-\$5.43	-\$8.77	-\$5.31	-\$5.21	-\$3.52
Land	\$23.21	\$33.65	\$15.14	\$1.21	\$20.92	\$9.75	\$13.08
Interest	-\$2.83	\$3.28	-\$0.86	-\$3.00	-\$2.46	-\$0.38	-\$0.02
Total Cost	-\$5.20	\$107.42	-\$10.89	-\$41.79	-\$17.55	-\$21.55	-\$12.55
Net Return to Management	\$149.62	\$334.73	\$134.30	\$116.24	\$158.51	\$112.96	\$280.16

¹ Does not include any production expenses paid by the the landowner.

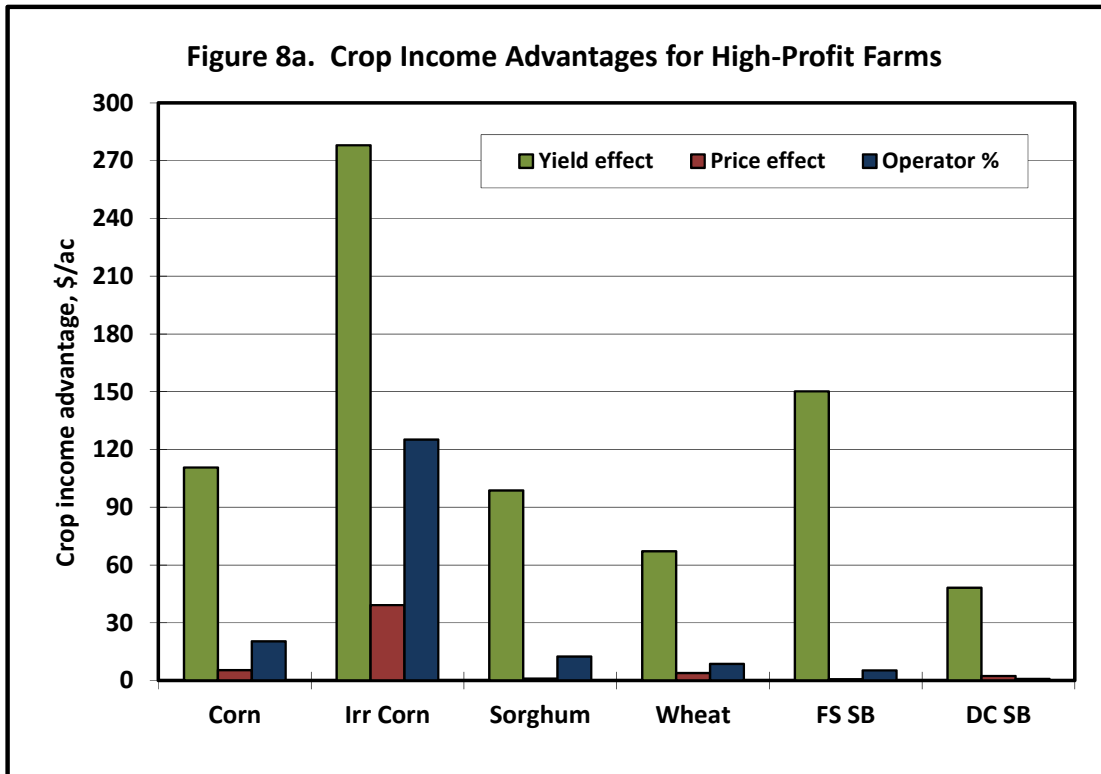


Figure 8a. Income advantages of high-profit farms over low-profit farms for different crops analyzed (sum of three bars equals the total income advantage).