

ECONOMIC & POLICY UPDATE

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Editors: Will Snell & Nicole Atherton

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Maximizing Value: 2022 Spring Application of Broiler Litter for Grain Crop Production

Author(s): Jordan Shockley

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Spring is here and grain producers across the state are gearing up for planting. One of the many decisions producers have to make before planting is in regard to their nutrient management plan. Broiler litter provides a great opportunity as a complete fertilizer and is being produced and used throughout the state in grain production. However, the value of broiler litter can vary greatly depending on the management practices, nutrient content of the litter, soil test data and commercial fertilizer prices.

Spring application of broiler litter maximizes plant available nitrogen resulting in the maximum economic value of broiler litter. As mentioned in previous issues, the average nutrient content of a ton of broiler litter in Kentucky (as received) is 50 lbs of nitrogen, 56 lbs of phosphorous, and 47 lbs of potassium. In addition to three macronutrients, broiler litter contains other beneficial elements such as micronutrients (zinc and copper), other secondary macronutrients (calcium, magnesium, and sulfur), and organic matter which are difficult to quantify in value. For this analysis, the three primary macronutrients (N, P₂O₅, and K₂O) will be used to determine the value of broiler litter. If your soil test recommendations supported the application of broiler litter and you applied or plan on applying this spring, that is equivalent to 50% commercial nitrogen, 80% commercial phosphorous and 100% commercial potassium per ton of broiler litter (as received). Therefore, the nutrients that would be available to the crop from an average ton of broiler litter in Kentucky would be 25 lbs of nitrogen, 45 lbs of phosphorous, and 47 lbs of potassium. With current fertilizer prices of \$899/ton for Urea (\$0.98/lb N), \$834/ton for DAP (\$0.52/lb P₂O₅) and \$800/ton for potash (\$0.67/lb K₂O), the average expected value of broiler litter is \$80/ton. Therefore, if you can buy broiler litter and have it delivered and spread for less than \$80/ton this Spring, broiler litter is a better economic option than commercial fertilizer. Last year, with considerably lower fertilizer prices, the nutrient value of an average ton of broiler litter was \$48/ton. But remember, broiler litter nutrient content will vary (see max and min values in Table 1). Figure 1 applies current fertilizer prices to each broiler litter sample submitted for

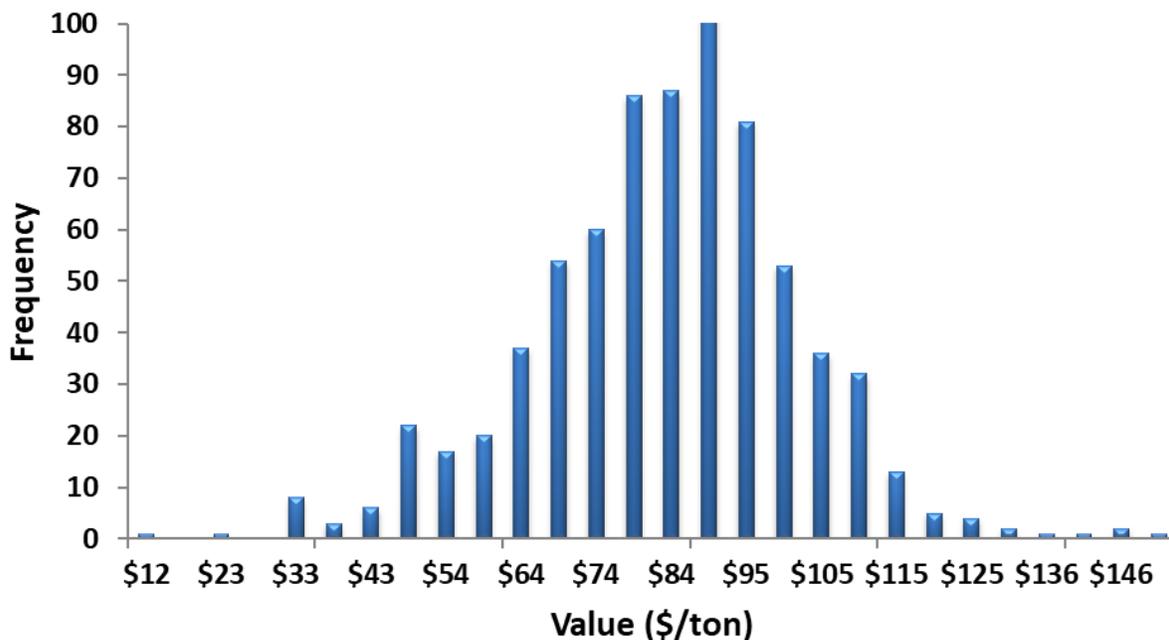
analysis to illustrate the range and frequency in the value of a ton of broiler litter. Given the wide range in value, make sure you measure broiler litter for nutrient content to understand what you are receiving and avoid the risk of overpaying for broiler litter.

Since the value of broiler litter is dynamic and always changing, a decision tool, "[Economic Value of Poultry Litter: Grain Crops](#)," is available so grain producers can enter soil test data, nutrient content of measured litter, commercial fertilizer prices, and management practices to determine the value of boiler litter.

Table 1: Sample statistics for the nutrient content of broiler litter samples (n=740)

	N (lbs/ton of litter)	P₂O₅ (lbs/ton of litter)	K₂O (lbs/ton of litter)
Average	50	56	47
Minimum	7	4	2
Maximum	186	124	109

Figure 1: Value of Broiler Litter Samples Given Current Commercial Fertilizer Prices



*Note: Figure assumes 50% N, 80% P₂O₅, and 100% K₂O plant available nutrients (n=740)

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Author(s) Contact Information:

[Jordan Shockley](#) | Associate Extension Professor | jordan.shockley@uky.edu

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Grain Profitability Outlook 2022

Author(s): Greg Halich

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The grain markets had already been climbing before Russia invaded Ukraine on February 24th. Since then, prices have been on a tear, particularly for wheat and corn. Current prices for 2022 new-crop delivery are around \$6.50/bu for corn, \$15/bu for soybeans, and \$10/bu for wheat in Kentucky (3/25/22). This is an increase of around \$2.25/bu for corn, \$4/bu for soybeans, and \$4.50/bu for wheat compared to what these prices were expected one year ago.

Tempering the increased revenue from higher grain prices are steep increases in fertilizer and fuel prices. Fertilizer prices have been rising steadily since last winter and we now have prices that are at all-time highs. Since January we have seen increases of \$1000/ton for anhydrous, \$400/ton for DAP, and \$450/ton for potash. This article will evaluate the combined effect of the increases in both commodity and input costs, and estimate profitability for the 2022 crop.

Costs for an efficient Western Kentucky farm are estimated in Table 1 on soil that averages 175 bushels of corn and 54 bushels of soybeans per acre. Machinery and labor costs include depreciation and overhead costs, as well as an opportunity cost for operator labor. Fuel costs are based on \$4.25/gallon diesel and 25-mile one-way trucking to the elevator.

Table 1: Expected Variable Costs 2022

	Corn	Soybeans
Inputs	175 bu	54 bu
Seed	\$100	\$60
Nitrogen	\$175	\$0
P, K, and Lime	\$91	\$72
Pesticides	<u>\$85</u>	<u>\$75</u>
Total Inputs	\$451	\$207
Machinery and Labor	\$153	\$113
Other		
Drying/Storage/Transport	\$40	\$7
Crop Insurance	\$20	\$15
Misc.	\$25	\$25
Land Rent	<i>Variable</i>	<i>Variable</i>
Operating Interest	\$17	\$9
Total Other	<u>\$102</u>	<u>\$55</u>
Total Costs	\$706	\$376

Note: Assumes 25 mile one-way trucking, \$4.25/gal fuel

Corn and soybean prices used in this analysis are based on forward contracting prices (as of late March) for an average of 2022 fall and winter delivery: \$15.15/bu for soybeans and \$6.60/bu for corn. Table 2 shows the expected gross return (does not include land rent) given the costs in Table 1 and expected commodity prices and yields.

Table 2: Summary Gross Return West Kentucky 2022 (per acre)

Yield and Price	Corn	Soybeans
Expected Yield (rotation)	175	54
Expected Price	<u>\$6.60</u>	<u>\$15.15</u>
Grain Revenue	\$1155	\$818
Gov't Payments	\$0	\$0
Crop Insurance Payments	\$0	\$0
Total Revenue	\$1155	\$818
Total Costs (Less Land Rent)	<u>\$706</u>	<u>\$376</u>
Gross Return (Less Land Rent)	\$449	\$442

Note: Does not include land rent. Subtract land rent to get net revenue.

The expected gross profit for this productivity soil is \$449/acre for corn and \$442/acre for soybeans. Assuming a 50-50 rotation the average gross return would be \$446/acre. The net return would be calculated by subtracting out the land rent. In Western Kentucky, much of the ground with

this type of productivity is being rented for \$150-225/acre. As an example, if we use a \$200 land rent, the net return (return to management and risk) would be a \$246/acre.

Table 3 shows a summary of the estimated gross returns for various soil productivities. Think of these yields as the long-run expected yields for a particular farm, not year-to-year variability. Costs are adjusted to account for different expected yields. The biggest change in costs is for trucking which adjusts on a 1-1 basis, but other costs such as fertilizer are adjusted at a lower rate. Looking at Table 3, it is easy to see how quickly gross profitability changes with expected yield.

Table 3: West Kentucky 2022 (per acre)

\$15.15 Soybeans (elevator) \$6.60 Corn (elevator)
\$0.92-N, \$0.56-P, \$0.69-K

Corn Yield (bu)	Soybean Yield (bu)	Gross Return Corn	Gross Return Soybeans	Gross Return Rotation
150	47	\$314	\$346	\$330
175	54	\$449	\$443	\$446
200	60	\$584	\$525	\$554

Note: Subtract land rent to get Net Return.

Observations

- 1) Potential profitability looks incredible for 2022, even after accounting for the unprecedented increases in input costs. I have heard farmers this winter claim they did not think they would not be able to make a profit this upcoming year. My guess is that they either did not have a very sharp pencil (possibly no pencil at all), or they were trying to temper profit expectations to keep landlords from raising rents in the upcoming year. We have not seen these magnitudes in gross returns since the peak of the ethanol boom. A grain farmer that can't make a significant profit in 2022 will either have terrible yields in conjunction with no crop insurance or doesn't have a pulse.
- 2) Wheat has seen the most dramatic price increases in the last month due to the war between two of the largest wheat exporters (Russia is still calling this a "special operation"). For those lucky Kentucky farms that planted wheat last fall, they should see even better returns than shown in Table 3 compared to full-season soybeans. Wheat yields vary across the state, but with current market conditions, gross returns are likely to be \$50-200 higher on mid-level soil productivity wheat ground, and \$150-250 higher on high-level soil productivity wheat ground.
- 3) Central Kentucky has a slightly higher cost structure due to its use of urea as the primary nitrogen source and longer trucking distances to key markets on average. Thus gross returns in this region are likely to be \$10-50 per acre lower than those shown in Table 3.
- 4) Corn profitability has increased more rapidly than soybean in the last month. Up to that point, soybean returns held a significant advantage over corn returns on most ground in Kentucky. The previous year was the same, so with current markets, the new pricing dynamics are providing an opportunity to get back into rotation on those farms that have deviated from their normal rotation. This, of course, assumes they can change out seed orders which may be a problem in many situations this close to spring planting.

Marketing

Remember the old adage “a bird-in-the-hand is worth two in the bush”. If you haven’t marketed much of your 2022 crop now would be a good time to start getting serious about it. While most farmers are reluctant to market very much of their future crop this far out, the current prices offered for the 2022 new crops are screaming for attention, and at least worth considering given the major shift in market conditions. Remember the other old adage: what the market giveth, the market can taketh.

Figure 1: July 2022 Wheat Futures (3/24/22)



Don't believe my numbers? I appreciate skepticism. The [corn-soybean budgets](#) can be used to come up with your own estimates.

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Author(s) Contact Information:

[Greg Halich](#) | Associate Extension Professor | greg.halich@uky.edu

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Summer Stocker Outlook for 2022

Author(s): Greg Halich and Kenny Burdine

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Driving through the Commonwealth it is clear that spring has arrived and we are seeing signs of pastures growing. Stocker operators are starting to place calves on pasture, which typically pushes calf prices to their seasonal highs. As of late March, calf prices have increased by more than \$20 per cwt from their lows last fall. At the time of this writing (March 25th), fall 2022 CME® feeder cattle futures were trading in the low-\$180's per cwt, more than \$15 per cwt higher than the April contract. Simply put, the futures market is suggesting that the price of heavy feeders between spring and fall should increase substantially, which should be reflected in strong calf prices this spring.

The purpose of this article is to assess the likely profitability of summer stocker programs for 2022 and establish target purchase prices for calves based on a range of return levels. While it is impossible to predict where feeder cattle markets will end up this fall, producers need to estimate this and not rely on the current price (March) for 750-850 lb feeder calves. The fall CME® feeder cattle futures price (adjusted for basis) is the best way to estimate likely feeder cattle prices for fall. Grazing costs including pasture costs, veterinary and health expenses, hauling, commission, etc. are estimated and subtracted from the expected value of the fall feeders. Once this has been done, a better assessment can be made of what can be paid for stocker cattle this spring in order to build in an acceptable return to management, capital, and risk.

Key assumptions for the stocker analysis are as follows: 1) Graze steers April 1 to October 1 (183 days), 1.5 lb/day gain (no grain feeding), 2% death loss, and 5% interest on the calf. The interest rate used in this analysis may seem high for producers who are self-financed or have very low interest rates, but is likely pretty close for those going through traditional lenders. Given these assumptions, sale weights would be 775 lbs and 875 lbs for 500 lb and 600 lb purchased calves, respectively. Using a \$183 CME® futures contract price for October 2022 to estimate sale price, a 775 steer is estimated to sell for \$1.74/lb and an 875 steer is estimated to sell for \$1.70/lb. This estimate uses a -\$10 per cwt basis for an 800 lb steer and a \$4 per cwt price slide. This basis estimate put the estimated Kentucky price \$2-3 per 100 wt lower than previous years to account for increased transportation costs getting these cattle to the Great Plains feedlots. These sale prices are also based on the assumption that cattle are sold in lots of 40 or more head. Stocker operators who typically sell in smaller lots should adjust their expected sale prices downward accordingly.

Estimated costs for carrying the 500 and 600 lb steers are shown in Table 1. Stocking rates of 1.0 acre per 500 lb steer and 1.2 acres per 600 lb steer were assumed in arriving at these charges. Most of these are self-explanatory except the pasture charge, which accounts for variable costs such as bush-hogging, fertilizer, seeding clovers, etc., and is considered a bare-bones scenario. Sale expenses (commission) are based on the assumption that cattle will be sold in larger groups and producers will pay the lower corresponding commission rate. However, producers who sell feeders in smaller groups will pay higher commission rates which could exceed \$50 per head based on the revenue assumptions of this analysis. Any of these costs could be much higher in certain situations, so producers should adjust accordingly.

Table 1: Expected Variable Costs 2022

	500 lb Steer	600 lb Steer
Pasture Charge	\$30	\$36
Vet	\$20	\$20
Interest	\$28	\$31
Death Loss	\$23	\$25
Sale	\$16	\$16
Haul	\$15	\$18
Mineral	\$10	\$12
Other (water, etc)	\$10	\$12
Total Variable Costs	\$152	\$170

Note: Interest and death loss varies slightly by purchase price.

Target purchase prices were estimated for both sizes of steers and adjusted so that gross returns over variable costs ranged from \$50-\$150 per head. This gives a reasonable range of possible purchase prices for each sized calf this spring. Results are shown in Table 2. For 500 lb steers, target purchase prices ranged from \$2.10 to \$2.29 per lb. For 600 lb steers, target purchase prices ranged from \$1.95 to \$2.11 per lb. When targeting a \$100 per head gross profit, breakeven purchase prices were \$2.19/lb for 500 lb steers and \$2.03/lb for 600 lb steers.

As an example of exactly how this works for a 500 lb steer targeting a \$100 gross profit:

<i>775 lbs steer x \$1.74 (expected sale price)</i>	<i>\$1,348</i>
<i>Total Variable Costs</i>	<i>- \$152</i>
<i>Profit Target</i>	<i>- \$100</i>
<i>Target Purchase Cost</i>	<i>\$1096</i>
<i>Target Purchase Price = \$1096 / 500 lbs = \$2.19 / lb</i>	

Table 2: Target Purchase Prices for Various Gross Profits 2022

Gross Profit	500 lb Steer	600 lb Steer
\$50	\$2.29	\$2.11
\$75	\$2.24	\$2.07
\$100	\$2.19	\$2.03
\$125	\$2.14	\$1.99
\$150	\$2.10	\$1.95

Notes: Based on costs in Table 1 and sales price of \$1.74/lb and \$1.70/lb for 775 lb and 875 lb sales weight respectively for 500 lb and 600 lb purchased steers.

For heifers, sale price for heavy feeders will be lower than comparably sized steers and they will not generally gain as well. In this analysis, we assumed the price discount for these heifers is \$12 per hundredweight lower than the same weight steers and we assumed heifers would gain 10% slower than steers. With these assumptions, purchase prices would have to be \$0.25/lb lower for 500 lb heifers and \$0.22 lower for 600 lb heifers compared to the steer prices found in Table 2. Thus when targeting a \$100 per head gross profit, breakeven purchase prices were \$1.94/lb for 500 lb heifers and \$1.81/lb for 600 lb heifers.

Your cost structure may be different from that presented in Table 1, and if so, simply shift the targeted gross profit up or down to account for this. If your costs are \$25 higher per calf, then you would shift each targeted profit down by one row: For example, you would use the \$125 gross profit to estimate a \$100 gross profit if your costs were \$25 higher. Another way to evaluate this is that a \$1 increase in costs would decrease the targeted purchase price by \$0.20 per cwt for 500 lb steers and \$0.17 per cwt for 600 lb steers.

It is important to note that the gross profits in Table 2 do not account for labor or investments in land, equipment, fencing, and other facilities (fixed costs). Thus, in the long-run, these target profits need to be high enough to justify labor and investment, as well as a management return. Typically, by the time this article is written in late-March, calf prices are approaching levels that would place returns on the lower end of the range analyzed. However, current calf prices are well below many of the target purchase prices estimated in this analysis given fall CME© futures prices. This is all the more reason that stocker operators should carefully think through their budgets and make rational purchasing decisions.

There is a tendency for calf prices to reach their seasonal price peak when grass really starts growing in early spring. There is little reason to think this won't happen in 2022, which will result in tighter expected margins for stocker cattle placed in the upcoming weeks. However, two unique factors are at play in 2022 that are worth discussion. First, there is an unusually large difference between the current prices for heavy feeder cattle and what the fall board is suggesting for late summer and fall prices. Some stocker operators may be bidding less aggressively if they are planning their programs based on current heavy feeder prices, rather than future's based fall expectations. Secondly, higher feed prices are likely discouraging feedlots from placing light calves on feed right now. This would result in less competition in calf markets, which may be keeping calf prices somewhat at bay. While there is no way to know for sure what the next few weeks will bring, there could be significant opportunities for stocker operators to place calves at a favorable margin this spring.

Finally, the placement of calves into stocker programs represents a significant cost and there is always a great deal of uncertainty about fall sale price. For this reason, stocker operators should also consider risk management strategies as they place calves into grazing programs. Hedging, through the sale of futures contracts, provides solid downside risk protection, but will subject the producer to margin calls if cattle prices increase. Entering a cash forward contract or offering cattle through internet sales with delayed delivery will reduce or eliminate price uncertainty, but will also limit marketing flexibility should weather conditions necessitate sale at a different time. Finally, strategies such as put options and Livestock Risk Protection (LRP) Insurance offer a less aggressive strategy that provides downside price protection (at a price), but more ability to capitalize on rising prices. And, the subsidy levels for LRP insurance have increased substantially over the last couple of year, making LRP much more attractive. Regardless of what makes the most sense for the individual producer, time spent considering price risk management is likely time well spent in these volatile markets. The best way to ensure profitability is to budget carefully and to manage downside price risk.

Greg Halich is an Associate Extension Professor in Farm Management Economics for both grain and cattle production and can be reached at Greg.Halich@uky.edu or 859-257-8841. Kenny Burdine is an Associate Extension Professor in Livestock Marketing and Management and can be reached at kburdine@uky.edu or 859-257-7273.

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Author(s) Contact Information:

[Greg Halich](#) | Associate Extension Professor | greg.halich@uky.edu

[Kenny Burdine](#) | Associate Extension Professor | kburdine@uky.edu

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Pre and Post-COVID Analysis of Select Spring Crops at the Auction

Author(s): Savannah Columbia

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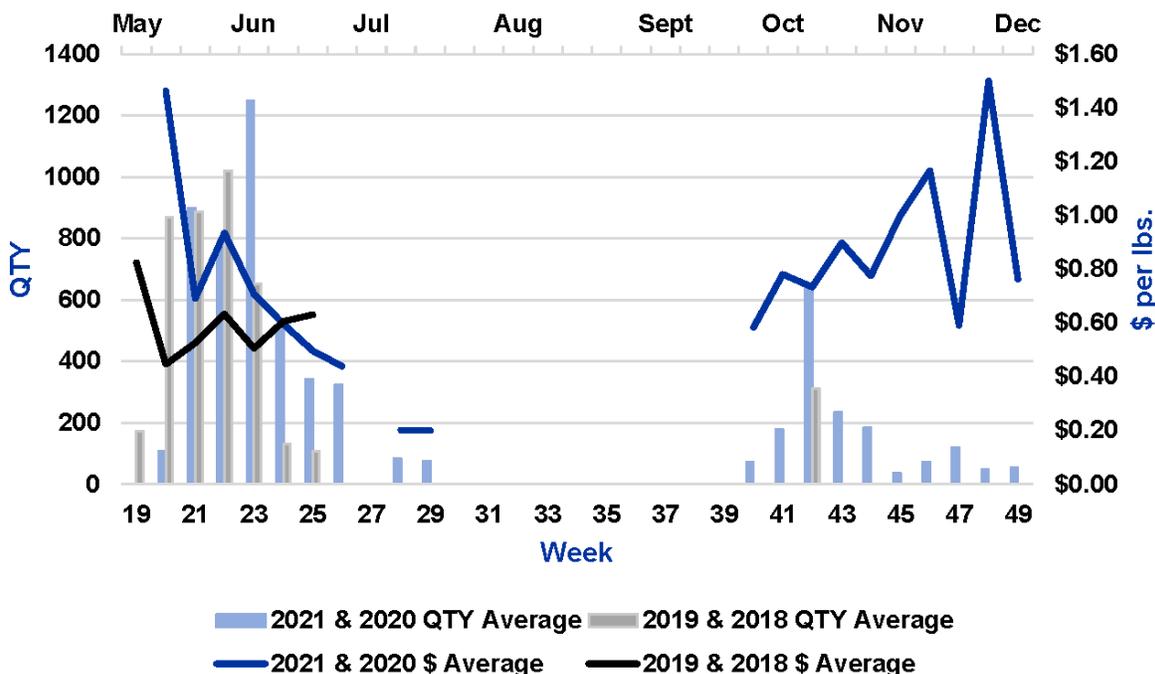
Spring is on the horizon in Kentucky. Many specialty crop growers have already begun thinking about which fruits and vegetables to cultivate and the ideal market channels in which to sell. There are many market channels available to producers – an important market channel for both Kentucky and many of our growers is the produce auction. There are a few produce auctions in Kentucky – with Fairview Produce Auction and Lincoln County Produce Auction being the largest. The analysis below uses data from the Fairview Produce Auction. While growers do not receive the same price premium at the auction compared to an urban farmer's market, there are reasons the auction is a viable market channel. The auctions serve as an aggregating market for larger quantity crops, while providing buyers with a place to purchase from a large selection of fresh, local produce.

COVID market conditions have been strongly evident in Kentucky auction markets with generally higher prices. With springtime being on the minds of many, average prices and quantities for 2021 and 2020 vs. 2019 and 2018 of three common spring and early summer crops are graphed below. 2021 and 2020 averages are considered post-COVID, while 2019 and 2018 averages are considered pre-COVID. As a preamble, the pre vs. post-COVID season averages for each crop are as follows: broccoli \$0.56 vs. \$0.76 per lb; strawberries \$4.11 vs. \$5.00 per quart; and tomatoes \$1.17 vs. \$1.45 per lb. Increased prices post-COVID can be observed initially, but high prices do not necessarily translate directly into higher profits. Both direct and in-direct farming costs have increased post-COVID and should be factored in when thinking about a farming operation.

Broccoli

- Price premiums are seen for early season broccoli around May, which fall as the spring quantity increases. Higher prices for broccoli are also seen at the end of the fall season when things are wrapping up and supply is not as saturated. Broccoli is a crop that can bring in both spring and fall revenue, which is an advantage for growers.
- When comparing pre and post-COVID, higher prices are observed for the post-COVID seasons. The season-average price for pre and post-COVID was \$0.56 vs. \$0.76 per lb. respectively. Post-COVID, a larger volume of broccoli was also coming through the auction – the fall season appears non-existent in 2019 and 2018. However, broccoli was sold in the fall of 2017 at the auction with a season average of \$0.62 per lb. Higher prices with a higher volume of products coming through the auction is a positive progression.

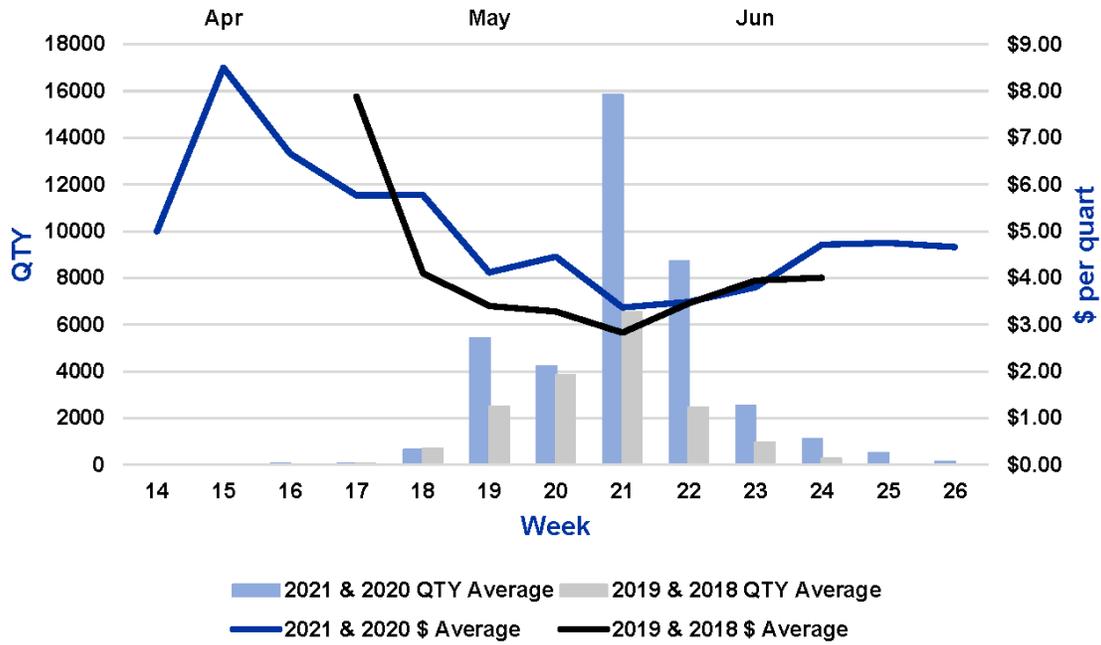
Figure 1: Pre and Post-COVID Price and QTY for Broccoli



Strawberries

- Again, price premiums were evident for early season strawberry crops during most weeks post-COVID. Price per quart fell mid-season as the market became saturated. Strawberries have a relatively short growing and selling period; however, small fruits have quite an impact in many of Kentucky's market channels.
- When comparing pre and post-COVID, higher prices are captured post-COVID along with a longer season. The season-average price for pre and post-COVID was \$4.11 vs. \$5.00 per quart. Additionally, more strawberry quart quantities traveled through the market channel for the post-COVID season.

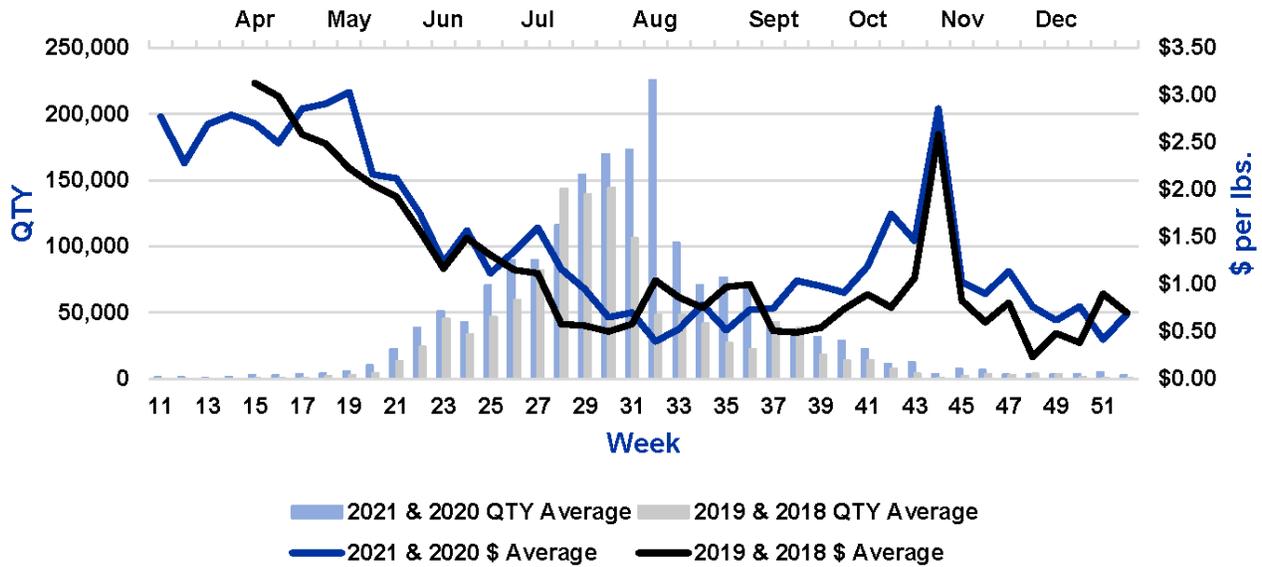
Figure 2: Pre and Post-COVID Price and QTY for Strawberries



Tomatoes: #1 & #2 Grade

- Tomatoes are sold in 10 or 20 lb. boxes and categorized at the auction. Grade #1 and #2 tomatoes must be mature, not overripe or soft, clean, well developed and formed, free from sunscald and decay, and smooth.
- Tomatoes are a fan favorite and have a long, bell-shaped season. Price premiums can be seen for early season tomatoes, with a short-lived spike around late October and November. Quantity is sparse around the beginning and end of the year, accompanied by high volume in the summer months and a peak in July and August.
- When comparing pre and post-COVID, prices stay very similar with the post-COVID season only coming in slightly higher. The season-average price for pre and post-COVID was \$1.17 vs. \$1.45 per lb. Quantity follows a similar pattern, with just a few weeks being an exception [weeks 31-37].

Figure 3: Pre and Post-COVID Price and QTY for Tomatoes



The produce auction is a great market channel for many producers. Higher quantities and prices are seen for the above crops and for many others. COVID-increased demand and a general interest in local food from household consumers and larger buyers can be attributed to this. However, growers should be aware that higher prices can offset higher on-farm input costs and the inflation of food prices in general. Growers should evaluate their higher input costs over and against the likelihood of higher prices. Price reports are a helpful tool that can aid in evaluation. Updated and frequent price reports from produce auctions in and around the state can be found through the [Center for Crop Diversification](#). A 2019-2021 Three-Year Average Prices & Quantities at Kentucky Produce Auctions report is in the works and projected to be published this spring – stay tuned for more information.

With this information and insight, we also ask ourselves – *will higher post-COVID prices continue? What can farmers expect to be the “new normal?”*

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Author(s) Contact Information:

[Savannah Columbia](#) | [Center for Crop Diversification](#) Extension Associate | savannah.columbia@uky.edu