Things to Consider When Trying to Weather the Storm

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Introduction

The days of $7.00 corn and $16.00 soybeans, which were great while they lasted, are unfortunately behind us. In their place are corn prices that are under $4.00 and soybean prices that are under $11.00, and barring a major crop failure, it looks like that is where prices are going to stay. While crop prices have fallen rather quickly, production costs and land prices are responding much more slowly. According to Mississippi State University's planning budgets, the variable costs of producing a bushel of irrigated corn were $3.31/bu for the 2016 growing season compared to $3.48/bu during the 2012 growing season, when prices peaked. According to those same budgets, the cost of producing a bushel of soybeans has actually increased from $5.73/bu in 2012 to $9.46/bu in 2016. Several factors have gone into the increase in the cost of producing a bushel of soybeans. The biggest contributing factor is a near tripling of the herbicide cost due to herbicide resistant weeds. Fungicide costs in 2016 are also almost three times as much as they were in 2012. Fertilizer, seed, and equipment costs are also slightly higher. With a tightening of profit margins in recent years and with a low price environment expected for the near future, careful management and planning has become increasingly important. This publication is intended to provide crop producers with a few ideas and strategies that can be implemented to help to manage their operations in a more efficient manner.

There are a few strategies that one can take to help to "weather the storm" in the face of lower crop prices and tighter (negative) margins. In this article, we break down the options into short-term strategies and medium-to-long-term strategies. Short-term strategies include actions that can be taken immediately such as budgeting, creating a marketing plan, and taking a closer look at input costs and efficiencies. Medium and long-term strategies include diversification, capital expenditure planning, and examining land values and/or rental agreements.

Short-Term Options

Budgeting, Planning, and Examining Input Costs

Creating a budget specific for each enterprise is a critical step in weathering the storm during times of tightening margins. Producers who farm land with dramatically different cost structures for a specific commodity should develop multiple budgets. This will assist in making other decisions such as the cash rent that could be paid for each farm. A budget can help to determine break-even prices, estimate cost of production, identify areas to cut costs, and can allow the decision maker to analyze the impacts changes might have on an operation's profitability. Additionally, a budget will allow producers to examine which expenses are front loaded and which are dependent on conditions during the growing season (weather and environmental factors). For example, cash rents and seed technology are incurred up front as such there is no flexibility to adjust these costs during the growing season. On the other hand herbicide applications and irrigation costs can be adjusted based on weed pressure and rainfall.

Several Land Grant Universities across the South have published readily available enterprise budgets for most major row crops in the region. Agricultural Economics Departments at Mississippi State University, University of Tennessee, University of Kentucky, University of Arkansas, and Texas A&M have published budgets specific to their own regions. These budgets are a great starting point when creating a personalized budget specific to the commodities grown on your operation. Some of them are available in an Excel format that can be easily downloaded and edited to fit each individual's needs. It is very important to make sure that the information used in constructing a budget is as accurate as possible.

Once an enterprise budget has been constructed, there are several ways that it can be used. One of the most important ways that a budget can be used is to determine cost of production, break-even prices, and marketing price points. A break-even price is typically calculated

Table 1. Soybean net return table for different yield and price combinations assuming a cost of production of $428/acre.

Soybean - Net Returns ($/acre)

		Yield (bu/acre)										
		20	25	30	35	40	45	50	55	60	65	70
Price ($/bu)	7.00	(288)	(253)	(218)	(183)	(148)	(113)	(78)	(43)	(8)	27	62
	7.25	(283)	(247)	(210)	(174)	(138)	(102)	(65)	(29)	7	43	80
	7.50	(278)	(240)	(203)	(165)	(128)	(90)	(53)	(15)	22	60	97
	7.75	(273)	(234)	(195)	(157)	(118)	(79)	(40)	(2)	37	76	115
	8.00	(268)	(228)	(188)	(148)	(108)	(68)	(28)	12	52	92	132
	8.25	(263)	(222)	(180)	(139)	(98)	(57)	(15)	26	67	108	150
	8.50	(258)	(215)	(173)	(130)	(88)	(45)	(3)	40	82	125	167
	8.75	(253)	(209)	(165)	(122)	(78)	(34)	10	53	97	141	185
	9.00	(248)	(203)	(158)	(113)	(68)	(23)	22	67	112	157	202
	9.25	(243)	(197)	(150)	(104)	(58)	(12)	35	81	127	173	220
	9.50	(238)	(190)	(143)	(95)	(48)	(0)	47	95	142	190	237
	9.75	(233)	(184)	(135)	(87)	(38)	11	60	108	157	206	255
	10.00	(228)	(178)	(128)	(78)	(28)	22	72	122	172	222	272
	10.25	(223)	(172)	(120)	(69)	(18)	33	85	136	187	238	290
	10.50	(218)	(165)	(113)	(60)	(8)	45	97	150	202	255	307
	10.75	(213)	(159)	(105)	(52)	2	56	110	163	217	271	325

prior to planting based on a yield target that is realistic for the production practices and land characteristics. This is calculated by simply dividing the total cost ($/acre) from the budget by the targeted yield. The result provides the price needed to cover all anticipated costs. The break-even price is extremely useful for budgeting purposes; however, during the growing season yield expectations and prices are continuously changing. As such, it is advisable to examine multiple yield and price combinations for a specific cost of production. For example, Table 1 shows the expected net returns for different yield and price combinations for soybeans with a cost of production of $428/acre. Profitable combinations of yield and price are shown in black, losses are shown in red. A basic profit table will allow producers to make more informed marketing decisions during the production year as expected yield and prices change. In a low price environment, it is important for producers to remember that profit maximization, not yield maximization, is the goal. Producers should carefully weigh the cost and revenue trade-offs for each input and management decision.

Unfortunately, regardless of marketing strategy, sometimes prices available in the market will not exceed break-even, thus creating a shortfall. Herein lies the importance of examining the costs within the budget and identifying ways to reduce costs and/or examine alternatives. When cutting costs it is important to keep in mind the corresponding changes in yield and/or revenue that will occur. For example, one might be able to significantly cut costs by reducing fertilizer or pesticide application, but making such cuts may also dramatically reduce yields and leave net returns unchanged or increase losses. Before making dramatic changes to inputs, it is recommended that producers consult with a local agronomist to determine the potential impact on yield. Removing the guess work from management decisions is a cost effective way to increase input efficiency. For example, soil testing at a University, government, or private lab can be a cost effective way to reduce fertilizer costs without reducing potential yield. Once the impact is known, put the changes into the budgets to estimate if they will improve profitability. In other words, try it out on paper first.

Risk Management Plan

Risk can come in many different forms. The two major forms of risk in agriculture are risks that reduce net worth and risks that reduce annual income. Examples of forms of risk that can reduce net worth include natural disasters that cause a loss of assets such as buildings and equipment, reduction in asset values (declining land prices), and increased debt. Risks that can reduce annual

net income are caused by factors such as low yields, low prices, higher costs, and changes in government policy. With so many sources of risk, it is important to have a risk management plan in place. While a risk management plan can never completely eliminate risk, the goal should be to limit exposure to risk and to avoid situations where the health of the operation could be compromised. One of the most common methods of reducing risk is through crop insurance. While there are many options available, the most common are those that protect against yield risk and those that protect against revenue risk. Purchasing a crop insurance policy is a good starting point to mitigate revenue or yield risk; however, additional complementary risk management strategies should be explored. Having a risk management plan that works in conjunction with your marketing plan can further reduce risk and provide cost savings through eliminating duplicate fees, premiums, or other expenses.

Create a Marketing Plan

Marketing is a continuous process that should span crop production years (*i.e.* pricing a portion of an estimated crop when a profitable opportunity emerges is always highly desirable regardless if it is the current crop or a crop to be produced in future years). On an annual basis, the first step in developing a marketing plan is determining the cost of production, break-even price, and marketing price points, as discussed above. The second step in developing a marketing plan is evaluating crop insurance coverage. After the price determination period for a commodity and region, producers should determine how much revenue or yield is protected by their crop insurance policies. The projected price (spring crop insurance price) sets the price floor for many marketing plans. Use the projected price and your APH yield as a starting point in your marketing plan and look for pricing opportunities that are above this price during the growing season.

Next the marketing plan should determine how much production should be sold at different price points and different times of the year. When trying to obtain the best price, there are often two strategies. The first is an offensive strategy where the producer waits until prices reach a certain predetermined level at which all costs are covered, and when they do the crop is sold. A defensive strategy occurs when some of the crop is sold at a predetermined trigger price in an attempt to prevent lost revenue. Incremental pricing is usually preferable as it spreads out marketing risk; however it is also important to match pricing with key production phases for your crop. For example, corn production can be divided into five marketing periods (a rough estimate of the percent of estimated production that could be priced): pre-planting (0%-25%); planting and emergence (10%-40%); tassel, pollination, and silk (20-60%); dough, dent, and mature (40%-75%); and harvest and post-harvest (50%-100%). The amount of estimated production priced will vary depending on the producers risk tolerance, crop progress and condition through the growing season, production practices, and the production variability of one's farms. It is important to continually revisit a marketing plan to incorporate changes in local, national, and global supply and demand, changes in estimated production on your farms, and changes in prices available. One cautionary note is for producers to avoid exchanging price risk for production risk (*i.e.* pricing more crop than will ultimately be produced).

There are also a few tips to remember when developing a marketing plan. First of all, it is best to avoid marketing all of one's production at one time. Disasters and crop failures can and do occur. Second, don't shoot for the moon. It is difficult, if not impossible to consistently hit the top of the market. Rather than aim for the best price possible, it is smarter to take the mindset that if you can lock in a profit, go ahead and do it. Lastly, keep your marketing plan sufficiently simple and flexible. Complicated marketing plans can be challenging to implement and often lack the flexibility to quickly react to changes in price or yield.

Long-Term Options

Building Working Capital

Working capital are the funds that are readily available to meet short-term financial obligations. Working capital is usually calculated by subtracting the farm's total current liabilities (operating loans, unpaid taxes, accounts payable, etc.) from the farm's current assets (cash, grain inventory, fertilizer, seed, etc.). Working capital acts as a financial reserve that is accumulated during surplus years to help a farm meet financial obligations during periods of financial stress. It is recommended that farmers try to maintain a working capital of 15-35% of gross revenue or total expense, especially given the volatility of today's markets.

All current assets are not equally important. The market value of grain inventory will change due to quality deterioration and price decreases, as such cash reserves provide more stability than inventory. Additionally, cash does not incur storage costs. Sufficient cash reserves provide a major benefit by allowing a producer to take advantage of opportunities in down markets that others

cannot, such as buying discounted machinery or land from those that are forced to sell assets.

There are a few ways a producer can manage working capital. When grain is sold, the cash generated can be used in several ways. Revenues can be used to pay liabilities, purchase inputs for the next season, or to make capital purchases. As explained below, carefully planning capital expenditures can assist in building working capital. During good years, producers are strongly encouraged to build cash reserves (yes, this may necessitate paying some income taxes!). Producers often develop strategies that minimize income tax for the current year without considering the long term benefits of paying some tax up-front in order to have flexibility in the future (capital purchases, estate planning etc.). Developing a long term strategy will help guide year-to-year decisions.

Another way to build working capital is to reduce current liabilities. While shorter repayment schedules on capital purchases may look feasible during surplus years, the larger principal payments can reduce working capital in years of financial stress. Capital assets that are not needed could also be sold to increase working capital, however tax implications must also be considered when liquidating assets.

Debt restructuring can be used to improve working capital. However, the underlying financial issues, which led to the diminished working capital, need to be addressed before restructuring debt. Additionally, moving current debt to intermediate or long term debt requires unencumbered assets to be pledged as security. Continued restructuring of debt will erode equity and may eventually necessitate exiting the industry. As such, careful evaluation of all alternatives (asset sale, retirement, exiting the industry, etc.) should be considered prior to restructuring debt.

Diversification

Growing more than one crop can often help mitigate price and production risk. Diversification generally means planting more than one crop, often in a rotation, in an attempt to increase farm profitability and sustainability. Diversifying a farming operation with a crop rotation system can help to manage insect infestations, reduce weeds, and improve soil health. It can also spread price risk over several crops. A prime example of how diversifying crops can help Southern producers mitigate price risk can be found in the 2016 growing season. At the same time that corn and soybean prices were falling, cotton prices spiked to levels that had not been seen in nearly two years. The correlation between the prices of the commodities is important to consider if revenue diversification is the goal. For example, corn and sorghum prices are typically highly correlated so how diversified is your revenue if both commodities are planted?

Production risk can also be managed through crop diversification. Most crops mature at different times during the growing season and critical points where rainfall is needed will fall at different times for different crops. For example, a mid-summer drought may be devastating for the corn crop, but a winter wheat crop will already be harvested by that point, and if weather patterns change and bring timely rains later in the season then cotton or soybean yields may still be good. Another prevalent benefit of crop diversification is weed and pest control. Rotating crops often results in different chemical applications that can be beneficial in managing resistant weeds or insects, thus reducing production risk. Furthermore, it is important to have diversification in chemistry to control weeds and insects.

Southern producers are at an advantage over many areas of the country due to the diversity of crops that can be produced. In addition to corn, soybeans, and wheat that are grown across much of the country, other options are available such as cotton, rice, sorghum, canola and peanuts that can be viable alternatives in a crop rotation. However, producers must also keep in mind that there are a few downfalls of growing additional crops. Probably the biggest downfall is the need for additional equipment. Cotton in particular will require specialized equipment for harvesting that can present a significant up-front investment cost. There is also a learning curve when considering a new crop, and it can often take several years of trial and error to perfect growing the new crop. If growing additional crops is not an option or too costly, trying capitalizing on local markets that demand higher quality grain. Milling companies and distilleries often offer larger premiums for higher quality grain (*e.g.* #1 white/yellow corn, less stress cracks and lower). Harvest and post-harvest management is critical to insure higher quality grain to meet the specifications required from these alternative markets. More specifically, harvest timing, harvest speed, grain dryer management, and grain storage monitoring are key to ensure higher quality grain.

Capital Expenditure Planning

Maintaining a suitable equipment complement for row crop producers can be extremely costly. The complexity and size of row crop equipment has increased substantially over the past 25 years, resulting in increased fixed (depreciation and capital recovery) and variable (operating and repair and maintenance) costs. Additionally, in periods of high row crop prices, such as 2006-2012, producers had a propensity to purchase equipment to avoid taxes, thus

creating surplus equipment capacity (equipment that would be sufficient to farm a greater number of acres than are presently being farmed). Surplus capacity can be beneficial for operations that are expanding or are looking to generate additional income via custom work and/or equipment share arrangements. However, unless these alternatives are available to spread out fixed costs surplus machinery can dramatically increase a producers cost of production. Reducing machinery costs can dramatically reduce the cost of production.

The value of equipment can decrease dramatically as commodity prices decrease and stay below the cost of production, creating additional financial stress. If the asset is financed, the current value may not be sufficient to liquidate the loan, requiring working capital or liquidation of other assets to retire the loan should the equipment need to be sold. An additional concern could be created from producer use of section 179. Section 179 allows producers to elect to recover all or part of the cost of certain qualifying property, up to a limit, by deducting depreciation in the year the equipment was purchased (IRS, 2016). Producers can elect the deduction instead of recovering the cost by taking annual depreciation deductions. Section 179 can create adverse future tax consequences if machinery must be sold. As such it is important to evaluate the market value of equipment, financing arrangements, and potential tax liabilities should the equipment need to be liquidated (add reference to Tufts accelerated depreciation article?).

Producers should assess their equipment compliment on an annual basis and make a short and long term plan for machinery replacements and new purchases. Annually, producers should ask themselves:

- Do I need to replace an existing piece of equipment?
- Has the amount of acreage or crop mix changed?
- What are my short and long-term machinery replacement/purchase needs?
    - o Creating a prioritized list may be extremely beneficial.
- Do I have surplus machinery capacity that can provide additional income?
- Does my county or region have access to custom machinery operations?
- Could a machinery share arrangement be possible with a neighbor?

By evaluating machinery needs annually producers can better foresee medium and long-term needs as well as identify emerging opportunities to reduce equipment costs. Custom farming can also help to avoid or postpone the sale of machinery when there is surplus machinery capacity while also generating additional revenue. Machinery purchases should be closely evaluated in conjunction with lease agreements as changes in land base overtime can dramatically alter machinery cost structure.

Examining Land Rental Agreements

Land prices and subsequently cash rents peaked across the Southern region in response to increased row crop prices seen during 2006-2012. However, they have yet to adjust in the magnitude required to reflect the recent downturn in commodity markets. This has resulted in land cost, specifically cash rents, representing the largest input cost of production for most in the region. This is evident once an enterprise budget is constructed as recommended previously. In addition to representing the largest input in the cost of production, cash rental agreements also result in the tenant bearing all the risk. This can be troublesome in a time when larger equipment is being purchased (as stated above) and additional land is required at peak prices to drive machinery costs lower. So how can producers manage this cost of production?

Renegotiating cash rental agreements to a lower price is one option. However, in all land rental renegotiations a good relationship between the producer and the landlord is key. Without a good relationship, new arrangements will be near impossible. Transparency is also key during negotiations with a landlord. Share enterprise budgets with the landlord so they understand what it costs for you to produce a crop and what you can afford to pay in cash rent. Also, understanding what other land in your area or region is renting for can help, especially when dealing with an absentee landowner.

Crop share or flex leases are other land rental agreements that should be considered as alternatives to cash rental agreements. Under a crop share agreement, both the tenant and the landowner share the risk proportionately based on input costs and/or output. A flex lease is a hybrid agreement between a cash rent and a crop share. Both allow you to decrease your cash outlay compared to a traditional cash rental agreement while sharing some risk with the landowner, however the tenant must forgo some profit potential. There are many options when structuring a crop share or flex lease so utilizing the available resources to customize an agreement that works for both the tenant and the landlord is critical. The North Central Farm Management Extension Committee has developed guidelines for both flex lease and crop share arrangements. In addition, the University of Kentucky has developed a

Flexible Cash Lease Decision-Aid to assist in determining the right flex lease arrangement, base rent, and bonus structure for the landowner. This can also be used to compare against a traditional cash rent agreement.

Renegotiating a new land rental arrangement takes time and willingness from both tenant and landowner. However, 100% of the acres do not need to be renegotiated to an alternative agreement. Start out with a portion of the land under a new arrangement until both parties are comfortable. Another option is renegotiating to short-term arrangements, such as one-year, to see where the commodity market is at that point. The ability to decrease the overall cost of production hinges on the tenant landowner relationship and the willingness of both parties adjust to this new commodity market.

Consequences and Conclusions

The current market outlook of corn prices under $4.00 and soybean prices under $11.00, will likely remain for the foreseeable future. At the same time, producers will continue to face high production costs and land prices. While production costs and land prices may fall in the future, any declines will take several years to fully materialize. In the meantime, producers will be faced with tight and/or negative margins each year that can quickly evaporate any equity that was built up during the high price period. Such a situation can make operating loans difficult to secure and may force many beginning farmers and those who are not financially secure to exit the industry. Additionally, producers who are approaching retirement with no heir to the operation may choose to exit the industry rather than burn existing equity.

Despite the tight (negative) margins that producers face, there are actions that can be taken to minimize losses and/or improve profitability and improve a farm's financial stability. In the short term, producers can be more aware of his/her cost structure by constructing detailed enterprise budgets for each commodity grown. This can help to estimate a per-bushel cost of production that can be used to determine a target price in a risk management and marketing plan. A budget can also help to identify areas where costs can be cut and the impact that cost cutting measures have on profitability. In the long term, farmers can find ways to diversify income. By growing a variety of crops in a crop rotation or targeting alternative markets, both price and production risk can be managed. While one crop may sustain losses in price or production, another crop may perform well. Capital expenditure planning is another long-term strategy that can improve a farm's financial sustainability. Evaluating equipment needs and purchases each year allows a producer to plan ahead and identify ways to reduce equipment costs. Finally, examining current land rental agreements and renegotiating terms can be a mechanism to reduce production costs. Landowner-tenant relationships, transparency, and willingness of both parties to make changes is key during renegotiations.

Reference

Internal Revenue Service (IRS). 2016. "Electing the Section 179 Deduction". Accessed online at: https://www.irs.gov/publications/p946/ch02.html.