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The 2011 costs of crop production

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The new common crop insurance policy, continued from page 2

units are, the more this is true. However, when an indemnity payment is triggered, it will likely be a larger payment. Moreover, the biggest risk in recent years has come on the price side of the equation rather than the yield side, and price declines have the same effect on enterprise and whole farm coverage as they do on basic or optional units. Nevertheless, farmers who opt for enterprise or whole farm coverage may want to consider purchasing add-on coverage to take care of localized weather events such as hail.

Table 1. Old and new crop insurance policy options

Old policy option	New policy option
Actual Production History (APH)	Yield Protection (YP)
Crop Revenue Coverage (CRC) Revenue Assurance with Harvest Price Option (RA-HPO)	Revenue Protection (RP)
Revenue Assurance (RA) Income Protection (IP)	Revenue Protection with Harvest Price Exclusion (RPE)



The 2011 costs of crop production

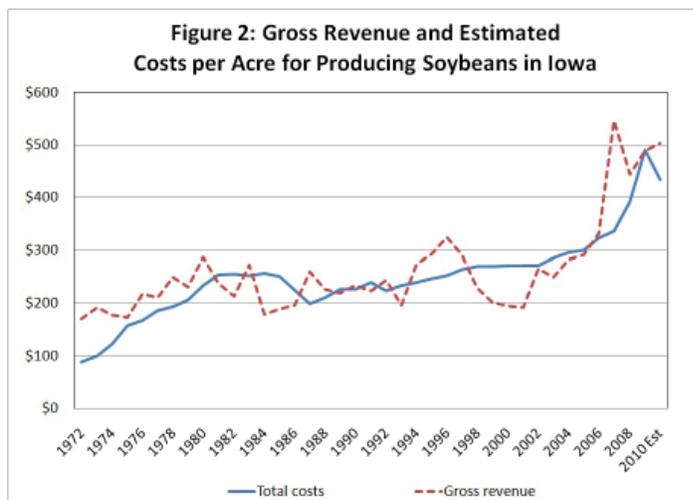
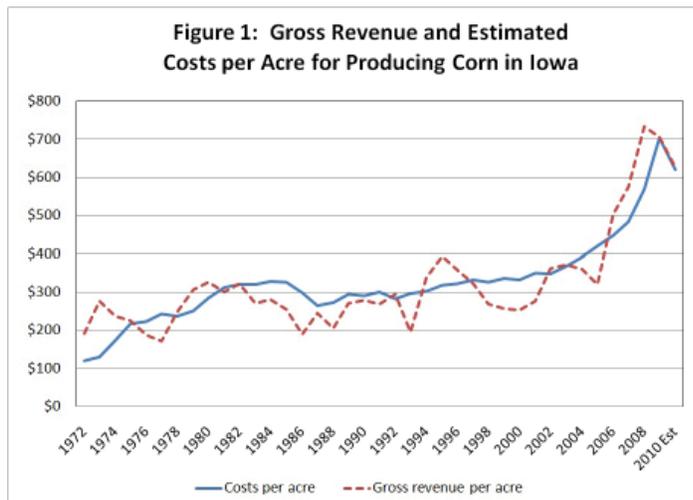
by Mike Duffy, extension economist, 515-294-6160, mduffy@iastate.edu

One of my jobs at Iowa State University is to produce the estimated costs of crop production. Over the years I have had the opportunity to work with some wonderful students and received information from many people around the state. In spite of all this help, sometimes I feel like I need to use a Ouija board because things are changing so fast.

We are currently in one of those times. I did a preliminary cost estimate in July. Since then the estimated costs have increased \$.34 a bushel for average yield corn following corn. For corn following soybeans, the cost estimated has increased \$.22 per bushel for the average yield.

This article will discuss some of what I have seen with respect to cost of production estimates. In preparing the estimates, I divided the costs of producing crops into four broad categories; machinery costs, costs for land, labor and general input costs. It could be debated whether this is the best way to think of production costs, but that is another discussion. Within these categories, I will cover where we have seen the most change over the years.

One of the first things you notice when examining the costs of production is that they are very closely correlated with the gross revenue for the crop. This is true for both corn (Figure 1) and soybeans (Figure 2). The relationship between gross revenue and costs



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of production is stronger for corn, but there is still a very strong relation between the gross revenue from soybeans and the cost to produce them.

Gross revenue changes in a more erratic manner than the costs of production. But, there are very definite patterns which produces a high degree of correlation between the costs and revenues. Notice in Figures 1 and 2 how the revenues and costs were increasing at a fairly steady rate during the 1970s. Then they were flat to declining slightly in the 1980s and early 1990s. The past few years have seen an explosion in both costs and returns. From 2002 to the peak in 2008, gross revenue for corn increased 103 percent. From 2002 to the peak in 2009, costs of production for corn increased 102 percent. Since that time both costs and revenues have fallen back, but we are in a situation where they are both rising again.

Part of the reason for the strong relationship between gross revenue and costs of production is the relation between gross revenue and land values. Land values have a strong correlation with costs of production. Between 1972 and 2010 land represented an average of 34 percent of the costs of producing corn and 45 percent the costs of producing soybeans in Iowa.

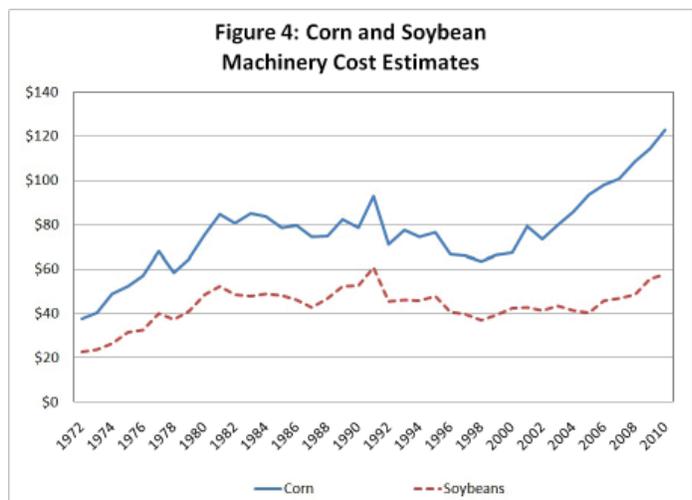
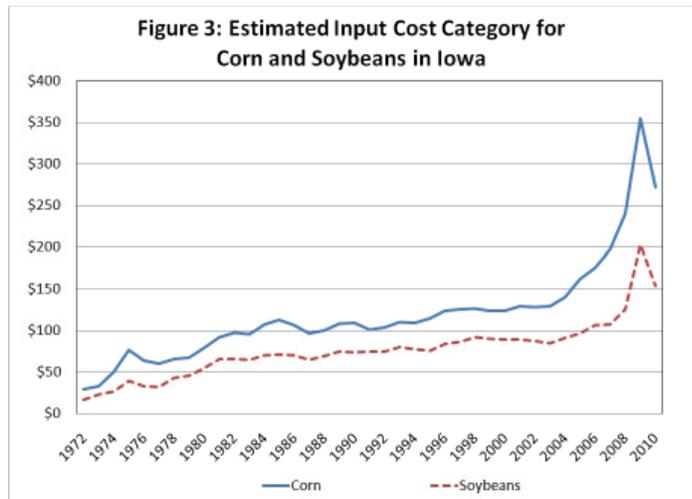
The percentage of total costs attributed to the land has varied by over 10 percent. During the late 1970s when land values were at record highs remains the period when land as a percent of total costs of production was at historical levels.

Input cost changes

The general input cost category includes seed, fertilizer, pesticides, insurance, interest and other such items. Overall since 1972, inputs have averaged 35 percent of the total cost of corn production ranging from 25 to 50 percent of the total costs. Soybeans have shown a similar pattern, although not as dramatic. Since 1972, inputs have averaged 30 percent of total costs ranging from 17 to 41 percent. Inputs as a percent of total costs have been increasing in the past few years. The individual cost components will be discussed in the next section.

Figure 3 shows the level of expenditure for inputs for both corn and soybeans. Notice that the recent rapid change shown in Figures 1 and 2 is again manifested in Figure 3. Corn input costs rose 111 percent from 2003 to 2010. Soybean input costs show an increase of 87 percent over the same time period.

Machinery costs have shown two major periods of increase. In the 1970s, machinery costs were increasing



at a fairly steady rate every year. Then the machinery costs remained relatively stable but in recent years costs have risen dramatically. Figure 4 shows the increases in machinery costs per acre. Machinery represents 24 percent of the total cost for producing corn and 18 percent of the total cost for producing soybeans.

Labor, as a percent of total cost, is almost exactly equal for corn and soybeans. Labor represents six percent of the total cost for corn and seven percent of the total cost for producing soybeans. Current technologies have substituted capital for labor and as a result labor is becoming less of a factor in terms of costs of production.

In general the figures show a period of rapid increase for both costs and revenues in the 1970s. This was followed by a period of relative stability and for the past seven or eight years we have again seen a rapid increase in both the revenue and the costs.

This observation is consistent with economic theory. In a competitive market when there is an increase in

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revenue (higher yields and/or higher prices) the costs of production will tend to follow. Land is the residual claimant after the increase in costs and the increase in the gross revenue. In other words, the input costs and other costs will increase when there is excess profit, what is left will be bid into the land in the form of higher rents or land values.

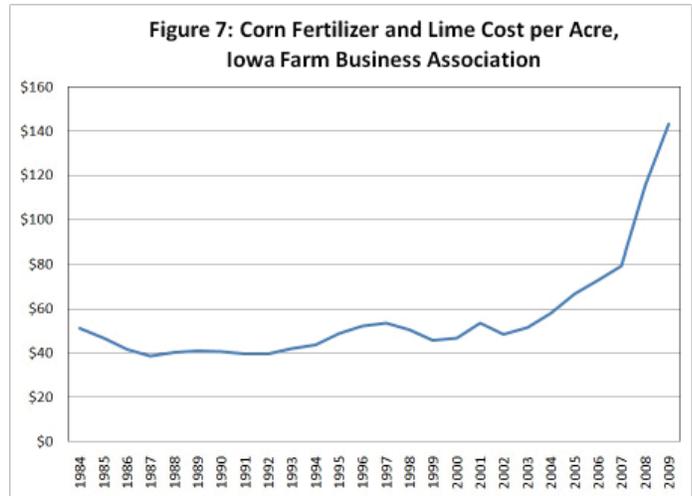
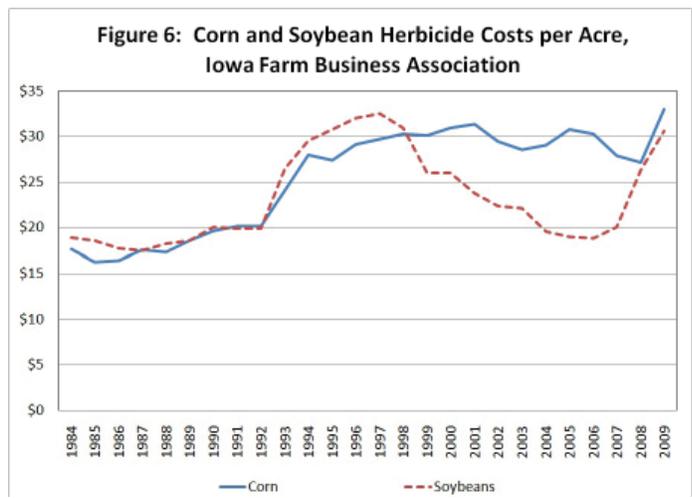
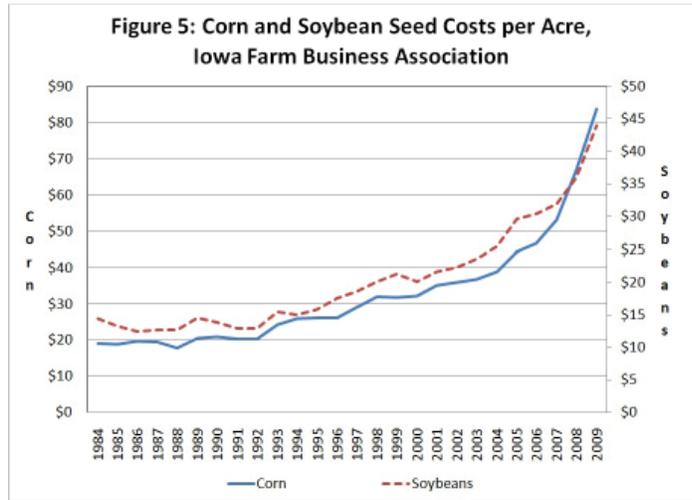
Specific input category changes

The cost of production data illustrate some of the major changes that have occurred in production agriculture over the past few years. One of the major changes has been in the use of genetically modified seeds. These seeds, both corn and soybeans, contain traits that have altered production practices and costs in a variety of ways. One of the major changes is using capital for a prophylactic treatment of pest problems. By having pest resistant traits contained in the seed the farmer pays more for the seed and foregoes the need to scout or estimate pest pressures.

The total impacts of this approach can be debated elsewhere but what is clear is the change in the cost structure that has occurred as a result. Figure 5 shows the cost per acre for both corn and soybeans since 1984. Notice that the costs begin increasing in the mid 1990s as the GMO seeds were being introduced. The costs in the past few years have increased substantially. Since 2005 the cost per acre for corn seed has increased 89 percent and the cost per acre for soybean seed has increased 49 percent.

One of the major traits in the seeds today is the resistance to certain herbicides. Figure 6 shows the change in herbicide costs for the farms in the Iowa Farm Business Association. There was a substantial rise in the 1990s but for corn the increase leveled out and for soybeans there was actually a substantial decrease in herbicide costs per acre in the mid-1990s. Both corn and soybean herbicide costs increased in the past year.

The other major category that has shown substantial changes over the past few decades is the fertilizer and lime costs for corn. Figure 7 shows the cost per acre for fertilizer and lime for farms in the Iowa Farm Business Association. The costs remained relatively flat until the early 2000s since then there has been a dramatic increase in costs. Since 2004 costs per acre are up almost one and a half times. Unfortunately, it appears quite likely that the costs for fertilizer will increase substantially in 2011.



Summary

The changes in costs of production reflect the changes that are occurring in Iowa agriculture today. Gross revenue has increased substantially, new seed technology has increased costs for seeds but has slowed the costs for herbicides and increased yields, and fertilizer

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costs reflect the cost of manufacturing and mining the material but more importantly they reflect the changing world conditions where the demand for the fertilizer nutrients has increased significantly.

These changes make it all the more important for farmers to be mindful of their costs. The rapid increases in prices can mask the tremendous increases that have been occurring in costs of production. Farmers must carefully evaluate the traits being offered in their seed and judge whether or not the added benefits of each

trait are worth the higher seed price. Fertilizer use should be based on need rather than a set practice. Trips across the field need to be carefully evaluated. The list of opportunities could go on but the point is that given the way agriculture is changing the costs to produce a bushel is just as important as the price per bushel or how many bushels you can produce. Being cost efficient isn't anything new but it takes on new importance in the world we live in today.

Updates, continued from page 1

Decision Tools and Current Profitability

The following tools have been added or updated on www.extension.iastate.edu/agdm.

Corn Profitability – A1-85

Soybean Profitability – A1-86

Season Average Price Calculator – A2-15

Returns for Farrow-to-Finish – B1-30

Returns for Weaned Pigs – B1-33

Returns for Steer Calves – B1-35

Returns for Yearling Steers – B1-35

Ethanol Profitability – D1-10

Biodiesel Profitability – D1-15

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