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# Continuous corn versus corn/soybeans: do the relative prices change the profit comparison?

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# Ag Decision Maker

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### Continuous corn versus corn/soybeans: do the relative prices change the profit comparison?

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

Rotating corn with soybeans is the primary production rotation in Iowa due to higher corn yields and reduced costs. Corn following soybeans does not need as much nitrogen fertilizer and generally there isn't a need for rootworm control.

As a result of these and other advantages the majority of Iowa's corn is followed by soybeans or to a lesser extent, another crop. In 2011 it is estimated that Iowa will harvest over 13 million acres of corn for grain and over 9 million acres of soybeans. This means approximately one-third of the corn is continuous corn assuming soybeans is the major substitute.

The relation between planted soybeans and corn has changed

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over time. As shown in Figure 1, the percentage of soybean acres to corn acres showed considerable variation during the 1980s. From 1992 the percentage increased steadily until 2001, indicating relatively more soybeans and less corn. But since 2001 the percentage of soybean acres relative to

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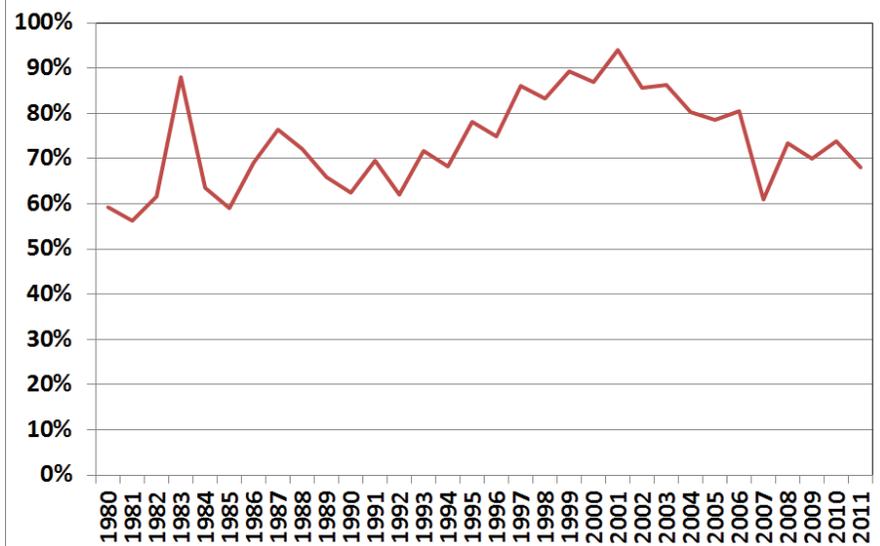
**Handbook updates**  
 For those of you subscribing to the handbook, the following new update is included.

**Crop Planning Prices -- A1-10**  
 (1 page)

**Estimating a Value for Corn Stover -- A1-70** (4 pages)

**2010 Iowa Farm Costs and Returns -- C1-10** (12 pages)  
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Figure 1. Planted Soybean Acres as a Percent of Planted Corn Acres in Iowa



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**Table 1: Preliminary Estimated Costs of Crop Production for 2012**

Crop/rotation	Estimated cost per acre	Assumed yield	Gross revenue with \$6 corn and \$12 soybeans	Net revenue per rotated acre
<b>Continuous corn (CC)</b>	\$852	165	\$990	<b>\$138</b>
Rotated Corn (RC)	\$796	180	\$1,080	\$284
Soybeans	\$548	50	\$600	\$52
<b>Corn/bean rotation</b>				<b>\$168</b>

corn acres has been dropping. In 2011, soybean acres were approximately two-thirds of the corn acres. This means almost a third of the corn acres are continuous, given the current cropping patterns in Iowa.

What is driving this change back to continuous corn? Is it the relative price change due to the increased demand for corn? Is it the lessening of the yield penalty for growing continuous corn? Is it the change in government programs? Or, is it a combination of factors?

When answering these questions it is important to consider the whole rotation. Evaluating a single crop in a rotation can give misleading results due to the rotational effects on costs and yields.

Table 1 shows the preliminary estimated costs of producing corn and soybeans in 2012. This table also shows the expected net returns per rotated acre assuming \$6 corn and \$12 soybeans.

Given the assumptions shown in Table 1, the corn/soybean rotation produces \$30 an acre more profit. But, if the continuous corn yields are increased five bushels per acre or if the price of corn increased to \$8.24, the returns between the rotations are identical.

With an increase to 170 bushel continuous corn (CC) yield and 180 bushel rotated corn (RC) yields the returns are the same, given the assumptions listed in the table. This means the breakeven difference between rotated and continuous corn is 10 bushels per acre. With the prices and costs assumed in Table 1, if farmers expect greater than a 10 bushel difference in yield they should stay with the corn/soybean rotation. But, if the differ-

ence is less than 10 bushels, the continuous corn produces the higher return.

Obviously the breakeven yield difference will change as relative price differences change. For example, if corn and soybeans increased to \$7 and \$13, respectively the breakeven difference would increase to 18 bushels. In other words, any CC yield less than 18 bushel lower than RC yield would make CC more profitable.

A long term rotation fertility study at the Iowa State University Northern Research Farm shows that the rotation effect is lessened by the amount and timing of nitrogen fertilizer. (Mallarino and Rueber, ISU, RFR-A01107) Table 2 presents the difference between the rotated corn yield and the continuous corn yield based on amount and timing of nitrogen application.

There is considerable variation in results between 160 pounds and 240 pounds of nitrogen. Additionally, the timing of the nitrogen application is also important. Notice, too, the difference between the 21 year average yields and the five year average yields. The yield advantage of a corn soybean rota-

**Table 2: Average Rotated Corn Yield Minus Average Continuous Corn Yield (bu./acre)**

Nitrogen level	1989 – 2011 Average	2007 – 2011 Average
160 pounds		
Spring applied	20.4	19.2
Fall applied	31.3	24.3
240 pounds		
Spring applied	10.2	2.5
Fall applied	23.2	18.1

Source: Mallarino and Rueber

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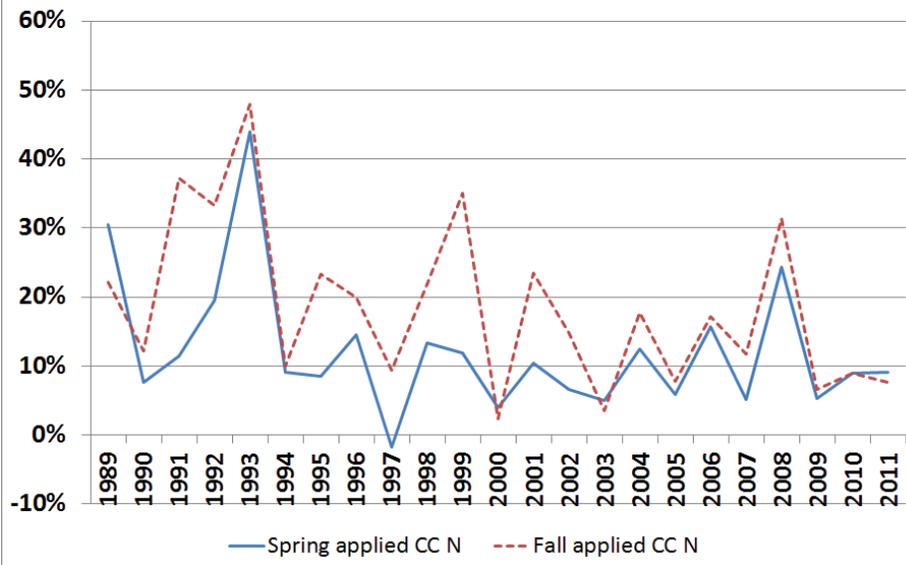
tion appears to be diminishing over time. The rotated corn will do relatively better under stress conditions.

Figures 2 and 3 show the RC yield advantage as a percent of the CC yield based on the timing and amount of nitrogen application. Notice how the relative yield advantage varies by year and application method.

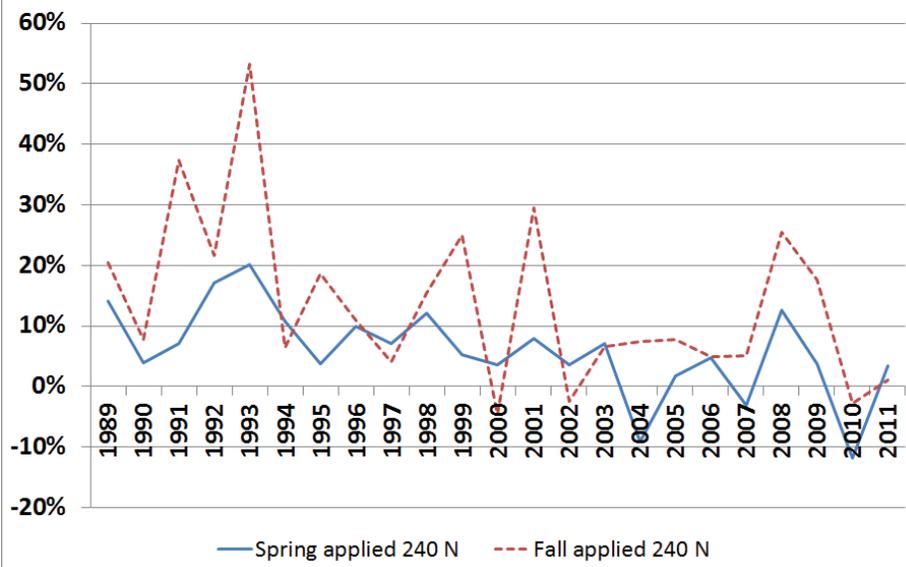
Tables 3 and 4 provide different ways to examine the relative advantage of the different rotations. In Table 3 the bushel advantage is listed and then the corn price necessary to equate the returns is shown. In Table 4 the bushel advantage needed for continuous corn is shown given different combinations of prices. For example, if the corn price is \$5.94 and the soybean price is \$13, Table 3 shows that any yield advantage for rotated corn less than five bushels per acre would mean continuous corn was more profitable. Similarly Table 4 shows that with \$6 corn and \$13 soybeans the yield advantage necessary for continuous corn must be more than six bushels per acre.

Changes in varieties and the demand structure for corn have caused farmers to rethink the rotation they follow. When evaluating the rotation choice it is important to remember the yield differences and the cost of production differences. It is important to evaluate the entire rotation, not just single years within the rotation.

**Figure 2. Percent Yield Advantage of RC over CC for 160 Pounds of N applied to CC in Spring or Fall**



**Figure 3. Percent Yield Advantage of RC and CC for 240 Pounds of N Applied to CC in Spring or Fall**



**Table 3: Breakeven Corn Prices by Yield Advantage of Rotated Corn over Continuous Corn**

Bushel advantage for rotated corn	Soybean Price \$12.00 per bushel	Soybean Price \$13.00 per bushel
5 Bushels	\$5.65	\$5.94
10 Bushels	\$6.00	\$6.30
20 Bushels	\$6.85	\$7.20
30 Bushel	\$8.00	\$8.45

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Farmers must also remember the impact of tillage on their rotation choices. They should also remember impacts that will go beyond the farm gate. Excess nitrogen is a source of water pollution and corn uses more nitrogen.

**Table 4: Yield Advantage**

Yield advantage of rotated corn over continuous corn to produce equal returns between the rotations based on different price scenarios. A higher yield advantage produces higher return for the corn/soybean rotation.

		Soybean Prices			
		\$11.00	\$12.00	\$13.00	\$14.00
Corn Prices	\$6.00	14	10	6	2
	\$6.50	20	16	12	8
	\$7.00	25	21	18	14
	\$7.50	29	26	22	19



## Employee management: the job interview, and what questions can I ask?

by *Melissa O'Rourke, extension farm and agribusiness management specialist, morourke@iastate.edu, 712-737-4230*

**H**iring good employees for your farm business is a multi-step process. One of the most important steps in that process is interviewing the candidates for the position available on your farm. It is important to take the time to carefully prepare for the interviewing these candidates.

Consider that when you are hiring an employee to come and work on your farm, you will be working with that person day after day. This is your opportunity to get to know that person and learn a little about what makes them tick before you make a commitment to one another – and you invest precious resources in that new employee. Remember, the investments that you make in human resources are perhaps the most significant investments you will make on the farm. Don't waste the time that you have together.

Well-prepared interviewers make a list of information that they want to share, as well as questions that they want to ask employment candidates. This helps to ensure that you don't overlook something important. It also helps you to evaluate and compare candidates since you are asking similar questions to each person.

In today's world, many potential employees may never have worked on a farm before. But you

can still ask about other work experience. Find out what kinds of challenges they have faced in previous employment, and how they handled it. Some questions might be:

- Tell me about a job you had that you didn't like. What didn't you like about it? How did you deal with that?
- Tell me about a job duty in the past that you really enjoyed. What did you like about it? Why?
- Think about work supervisors you have had in the past. Was there someone that you really enjoyed working for? Why?

Some of your new employees may have a great deal to learn about working on a farm. Try to get an idea how they will approach learning new tasks.

- What do you do when you need to learn something new?
- Tell me about something new that you learned to do in the past two years, and how you went about learning that new skill.
- Have you ever helped someone to learn to do a new task? Did you enjoy that? How did you go about it?

Some employers make the mistake of spending most of the interview talking, instead of listening.

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